

The
OHIO STATE UNIVERSITY
BULLETIN

VOLUME XXVIII

APRIL 7, 1924

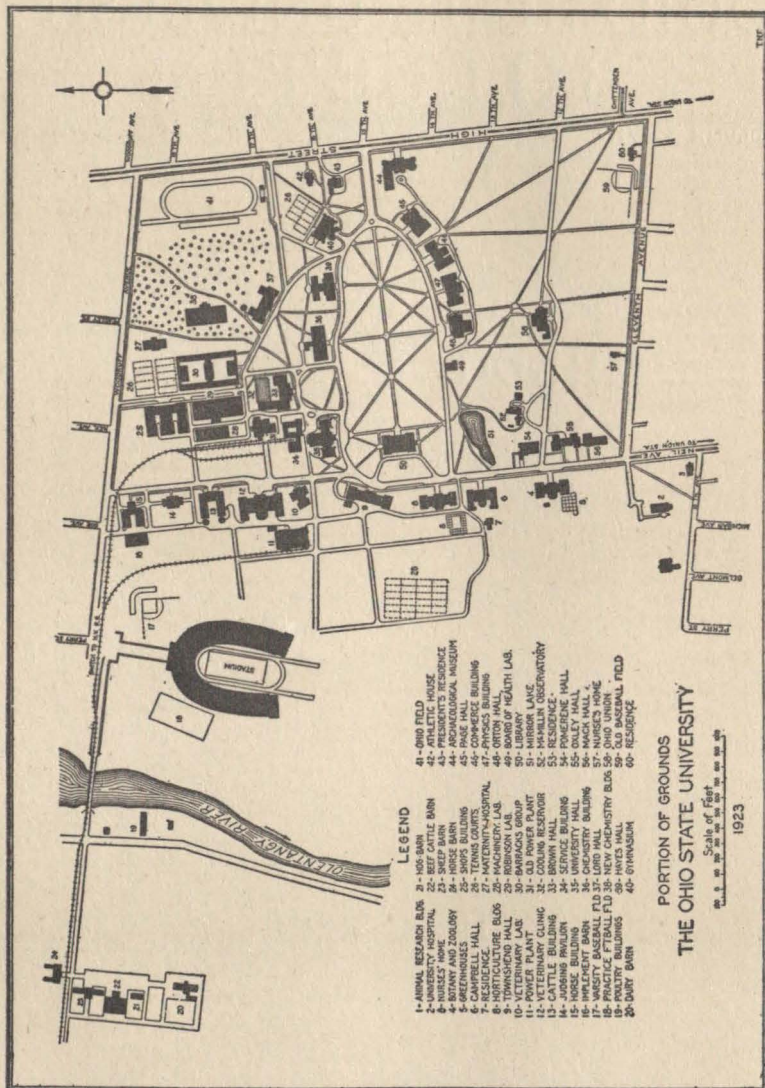
NUMBER 22

GRADUATE SCHOOL

1924-1925

PUBLISHED BY THE UNIVERSITY AT COLUMBUS

Entered as second-class matter November 17, 1905, at the postoffice at Columbus, Ohio, under Act of Congress, July 16, 1894. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917. Authorized July 10, 1918.



PORTION OF GROUNDS THE OHIO STATE UNIVERSITY

Scale of Feet
0 100 200 300 400

1923

UNIVERSITY CALENDAR

SUMMER QUARTER

June 13 to 21
June 16 to 20
June 16

June 17
June 21
June 23
July 4
July 21, 22, 23
July 23
July 24
August 27, 28, 29
August 29
August 30

1924

Physical Examination for all new students.
Entrance Examinations.
Latest day for registration and payment of fees without penalty.
Classes begin, 7:30 A. M.
Intelligence Test for all new students (Saturday A. M.).
Latest day for registration.
Independence Day. No classes.
Final Examinations, first term.
First term ends, 5:30 P. M.
Second term begins, 7:30 A. M.
Final Examinations, second term.
Autumn Convocation, 4:00 P. M.
Summer Quarter ends, 12 M.

AUTUMN QUARTER

September 22 to 26
September 25 to October 3
September 29

September 30
October 1
October 4
October 6
November 11
November 27
December 17, 18, 19, 20
December 19
December 20

Entrance Examinations.
Physical Examination for all new students.
Latest day for registration and payment of fees without penalty.
Classes begin, 8:00 A. M.
President's Annual Address, 11:00 A. M.
Intelligence Test for all new students.
Latest day for registration.
Armistice Day. Ceremonial Exercises, 10 A. M. to 12 M.
Thanksgiving Day. No classes.
Final Examinations.
Winter Convocation, 4:00 P. M.
Autumn Quarter ends, 6:00 P. M.

WINTER QUARTER

January 2 to 9
January 3

January 5
January 10
January 12
February 22
March 18, 19, 20, 21
March 20
March 21

1925

Physical Examination for all new students.
Latest day for registration and payment of fees without penalty.
Classes begin, 8:00 A. M.
Intelligence Test for all new students (P. M.).
Latest day for registration.
University Day (Sunday).
Final Examinations.
Spring Convocation, 4:00 P. M.
Winter Quarter ends, 6:00 P. M.

SPRING QUARTER

March 28

March 30
March 30 to April 3
April 4
April 6
May 16
May 30
June 10, 11, 12, 13
June 13
June 14
June 15
June 16
June 16
June 22 to September 2
September 28 to December 19

Latest day for registration and payment of fees without penalty.
Classes begin, 8:00 A. M.
Physical Examination for all new students.
Intelligence Test for all new students (P. M.).
Latest day for registration.
Competitive Drill, Cadet Regiments.
Memorial Day. No classes.
Final Examinations.
Alumni Day.
Baccalaureate Sermon.
Class Day.
Summer Convocation, 10:00 A. M.
Spring Quarter ends, 12 M.
Summer Quarter.
Autumn Quarter.

CALENDAR FOR 1924

JANUARY							FEBRUARY							MARCH							APRIL						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	1	1	2	3	4	5	6	1	1	2	3	4	5	6	1	1	2	3	4	5	6	1
7	8	9	10	11	12	2	7	8	9	10	11	12	2	7	8	9	10	11	12	2	7	8	9	10	11	12	2
13	14	15	16	17	18	3	13	14	15	16	17	18	3	13	14	15	16	17	18	3	13	14	15	16	17	18	3
19	20	21	22	23	24	4	19	20	21	22	23	24	4	19	20	21	22	23	24	4	19	20	21	22	23	24	4
25	26	27	28	29	30	5	25	26	27	28	29	30	5	25	26	27	28	29	30	5	25	26	27	28	29	30	5
31	.....	.....	.....	.....	.....	6	31	.....	.....	.....	.....	.....	6	31	.....	.....	.....	.....	.....	6	31	.....	.....	.....	.....	.....	6

MAY							JUNE							JULY							AUGUST						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	1	1	2	3	4	5	6	7	1	1	2	3	4	5	6	7	1	2	3	4	5	6
7	8	9	10	11	12	2	7	8	9	10	11	12	13	6	7	8	9	10	11	12	3	4	5	6	7	8	9
13	14	15	16	17	18	3	13	14	15	16	17	18	19	20	13	14	15	16	17	18	19	10	11	12	13	14	15
19	20	21	22	23	24	4	19	20	21	22	23	24	25	26	27	18	19	20	21	22	23	24	25	26	27	28	29
25	26	27	28	29	30	5	25	26	27	28	29	30	31	27	28	29	30	31	24	25	26	27	28	29	30	31	2
31	.....	.....	.....	.....	.....	6	31	.....	.....	.....	.....	.....	.....	27	28	29	30	31	31	.....	.....	.....	.....	.....	.....	.....	.....

SEPTEMBER							OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	2	3	4	5	6	1	1	2	3	4	5	6	7	1	1	2	3	4	5	6	7	1	2	3	4	5	6
7	8	9	10	11	12	2	7	8	9	10	11	12	13	6	7	8	9	10	11	12	3	4	5	6	7	8	9
13	14	15	16	17	18	3	13	14	15	16	17	18	19	10	11	12	13	14	15	14	15	16	17	18	19	20	
19	20	21	22	23	24	4	19	20	21	22	23	24	25	16	17	18	19	20	21	22	21	22	23	24	25	26	
25	26	27	28	29	30	5	25	26	27	28	29	30	31	23	24	25	26	27	28	29	28	29	30	31	
31	6	31	30	31	30	29	30	31	

CALENDAR FOR 1925

[illegible]

ADMINISTRATION

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.....	EDITH D. COCKINS
Office: Administration Building—99314	
Residence: 1348 Neil Ave.—16310	
University Examiner.....	BLAND L. STRADLEY
Office: Administration Building—99353; N. 939	
Residence: 318 W. Seventh Ave.—N. 7454-J	
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Residence: 265 Tulane Rd.—N. 2240-J	
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Office: Administration Building—99332; N. 32	
Residence: 1755 N. Fourth St.—11954	
Dean of Women.....	ELISABETH CONRAD
Office: Pomerene Hall—99367; N. 3931-W	
Residence: 1981 Indianola Ave.—11252	
House Superintendent, Residence Halls.....	EMMA McKINLEY PROUT
Office and Residence: Mack Hall—99352; N. 4146	
Manager of Ohio Union.....	EDWARD S. DRAKE
Office and Residence: Ohio Union—99359, one ring; N. 3270	

*Died, March 22, 1924.

THE OHIO STATE UNIVERSITY

- Hostess of Pomerene Hall**.....**HARRIET W. HOBLER**
 Office: Pomerene Hall—99367; N. 2402-J
 Residence: 62 Thirteenth Ave.—N. 2760-J
- Director of Student Health Service**.....**H. SHINDLE WINGERT**
 Office: 101 Hayes Hall—99393
 Residence: 22 Twelfth Ave.—11383
- Superintendent of Buildings and Grounds and Chief Engineer**.....
**WILLIAM C. McCracken**
 Office: Service Building—99370; N. 718
 Residence: 8 West Woodruff Ave.—11823
- University Architect**.....**JOSEPH N. BRADFORD**
 Office: 100 Brown Hall—99361
 Residence: 55 E. Oakland Ave.—14844
- Purchasing Agent**.....**RAY M. ROYER**
 Office: Administration Building—99374; N. 3222
 Residence: 1828 Arlington Ave., Upper Arlington—H. 2850-J
- Director of Stores and Receiving Department**.....**FRED E. JONES**
 Office: Service Building—99354; N. 3813
 Residence: 255 Oakland Park Ave.—N. 3900-J

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 Office: Administration Building—99353; N. 939

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 Office: 108 Hayes Hall—99389; N. 3045

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- Secretary**.....**EDITH D. COCKINS**
 Office: Administration Building—99314

THE OHIO STATE UNIVERSITY ASSOCIATION

- Secretary**.....**J. LEWIS MORRILL**
 Office: Ohio Union—99350
 Residence: 459 W. Eighth Ave.—16602

THE GRADUATE SCHOOL

Dean.....WILLIAM McPHERSON

Office: 204 University Hall—99399
Residence: 198 Sixteenth Ave.—11279

THE GRADUATE COUNCIL

THE DEAN OF THE GRADUATE SCHOOL, Chairman, *ex officio*
 CLARENCE EDWARD ANDREWS, Ph.D., Professor of English
 FREDERIC COLUMBUS BLAKE, Ph.D., Professor of Physics
 LEONARD BLOOMFIELD, Ph.D., Professor of German and Linguistics
 BOYD HENRY BODE, Ph.D., Professor of Principles and Practice of Education
 HAROLD ERNEST BURTT, Ph.D., Professor of Psychology
 FRANCIS WILLIAM COKER, Ph.D., Professor of Political Science
 ARTHUR CHARLES COLE, Ph.D., Professor of American History
 DANA JAMES DEMOREST, B.Sc. in Ch.E., Professor of Metallurgy
 MATTHEW BROWN HAMMOND, Ph.D., Professor of Economics
 ROY GRAHAM HOSKINS, Ph.D., M. D., Professor of Physiology
 JOHN F. LYMAN, Ph.D., Professor of Agricultural Chemistry
 HERBERT OSBORN, D.Sc., Research Professor of Zoology and Entomology
 EXECUTIVE COMMITTEE—The Dean, Professor Lyman, and Professor Hammond

REPRESENTING OHIO UNIVERSITY

EDWIN WATTS CHUBB, M.A., Litt. D., Professor of Rhetoric and English Literature,
Ohio University

REPRESENTING MIAMI UNIVERSITY

HARVEY C. BRILL, Ph.D., Professor of Chemistry, Miami University

FELLOWS AND SCHOLARS

1923-1924

duPONT de NEMOURS FELLOW

JOHN MOUK ORT.....Chemistry

GRASSELLI FELLOW

HOMER LESLIE CUPPLES.....Chemistry

ROBINSON FELLOW

HOMER MORGAN FAUST.....Engineering

BUREAU OF MINES FELLOWS

ANDREW IRVING ANDREWS.....Chemistry
 FRED T. HEATH.....Ceramics
 JAMES GORDON PHILLIPS.....Ceramics

THE OHIO STATE UNIVERSITY

Y. M. C. A. FELLOWS

JOHN WILBUR DORST.....	Sociology
PRATHER JAMES HAUSER.....	Sociology

NATIONAL LIMESTONE ASSOCIATION RESEARCH FELLOW

LEVIN B. BROUGHTON.....	Soils
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NATIONAL RESEARCH COUNCIL FELLOWS

ERRETT C. ALBRITTON.....	Physiology
JACOB W. BULGER.....	Entomology

SPECIAL RESEARCH FELLOW

WILLIAM HALE CHARCH.....	Chemistry
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UNIVERSITY FELLOWS

SHERMAN WEAVER BILSING.....	Entomology
RACHEL H. EDGAR.....	Chemistry
ROBERT JAMES HAVIGHURST.....	Chemistry
RUTH LOVING HIGGINS.....	American History
ROBERT LEE MORTON.....	School Administration
ROBERT AMBROSE OSBORN	Chemistry
NANCY ELIZABETH SIDWELL.....	Principles of Education
DWIGHT HULL STEVENSON.....	School Administration
WAID WRIGHT TUTTLE.....	Physiology

UNIVERSITY SCHOLARS

MARGARET MARY BARNETT.....	Latin
FAYE MARIE BROOKE.....	French
MARION WILLIAM CASKEY.....	Zoology
LLOYD ELSWORTH DEVOL.....	Economics
RALPH LAWRENCE DEWEY.....	Economics
TADASHI FUJIMOTO	Physics
LURA MARION JEWELL.....	Principles of Education
JOHN ARCHIBALD MCCLISTER.....	Political Science
PAUL HERMAN MAUTZ.....	Soils
M'DELLA MOON	Botany
HENRY FRANCIS PALMER, JR.....	Chemistry
DOROTHY FRANCES PORTER.....	Spanish
CHARLES GIDEON STEWART.....	Sociology
SIANG CEE SUNG.....	Chemistry
LLOYD N. YEPSEN.....	Psychology
HAROLD LELAND YOCHUM.....	Latin

THE OHIO STATE UNIVERSITY

The Ohio State University is supported by appropriations from the State and Federal governments. It is the largest university in Ohio. It ranks seventh in size in the United States and fifth among the state universities, and is situated within the corporate limits of the city of Columbus.

The Campus and farm cover 950 acres. The Campus proper contains 115 acres. There are sixty-five buildings on the University grounds, forty-eight of which are devoted to instruction. The total value of land, buildings, and equipment is \$8,948,335.24. The enrollment in the University, November 1, 1923, was 9725, and the number of instructors and administrative officers, 723.

ORGANIZATION

For convenience of administration the departments of the University are grouped into organizations called Colleges. The Ohio State University comprises ten Colleges and a Graduate School, each under the administration of a Dean and College Faculty, as follows:

Graduate School	College of Education
College of Agriculture	College of Engineering
College of Arts, Philosophy, and Science	College of Law
College of Commerce and Journalism	College of Medicine
College of Dentistry	College of Pharmacy
	College of Veterinary Medicine

THE LAKE LABORATORY

The University maintains a Lake Laboratory at Put-in-Bay during the Summer Quarter, which provides opportunity for the investigation of the biology of the Lake region, and for giving certain courses of instruction in the Departments of Botany, and Zoology and Entomology.

THE UNIVERSITY YEAR—FOUR QUARTERS

The University year is divided into four Quarters, each approximately twelve weeks in length. The Summer Quarter is further divided into two terms of approximately six weeks each. Complete courses that are so announced may be taken for either term or for the entire Quarter.

Nearly all of the elementary courses are five hours each week. A number of more advanced courses are two or three hours each week. The schedule is so arranged that a student may enter at the beginning of any Quarter and may, without hardship, be absent during any Quarter. For the most part students will take one Quarter each year as a vacation period—usually the Summer Quarter. By attendance in all four Quarters the duration of the time of residence for a degree may be shortened. Many persons, particularly teachers, avail themselves of the advantages offered in the Summer Quarter.

This bulletin is devoted to the work of the Graduate School for the academic year, 1924-1925.

NOTE: University bulletins may be obtained by addressing the University Examiner, The Ohio State University, Columbus, Ohio, and stating the college in which the writer is interested.

THE GRADUATE SCHOOL

GENERAL INFORMATION

The office of the Graduate School is in University Hall. The office is open from 8:00 a. m. to 12 m. and 1:30 to 5:00 p. m. daily, except Saturday. On Saturday, it is open from 8:00 a. m. to 12:00 m.

ORGANIZATION AND ADMINISTRATION

The instruction and training of graduate students has been one of the functions of the Ohio State University since 1878, when the first graduate student was in residence. For a number of years the graduate work of the University was unorganized and each department conducted its own work with little reference to that of other departments. After the University was divided into colleges, each college controlled the graduate work offered in the various departments constituting that college. In 1902, however, the graduate work within the College of Arts, Philosophy, and Science had assumed sufficient proportions to warrant the organization of a Graduate School to secure an effective and systematic arrangement of the graduate work of that college. Finally in 1911, there was organized the Graduate School of the University to administer all the graduate work offered in the several departments of the University. This school is under the administration of a Graduate Council consisting of the Dean and fourteen members, twelve of whom are appointed from among those offering graduate work in the Ohio State University and one each from the faculties of Ohio University and Miami University. This council reports directly to the University Faculty, which is the legislative body of the Graduate School, as well as of the eleven colleges.

It is the custom of the University to endeavor to secure from time to time representative scholars who are members of the faculties of Ohio colleges to give graduate courses in the University. By action of the Board of Trustees of the University such scholars, during the year in which this service is rendered, are eligible to membership in the Graduate Council, the membership of which is increased to permit of such appointments.

All communications and inquiries regarding matters connected with the Graduate School, whether from prospective students or from those whose work is in progress, should be directed to the Dean of the Graduate School.

AGREEMENTS BETWEEN THE OHIO STATE UNIVERSITY AND OTHER STATE-SUPPORTED INSTITUTIONS BEARING ON GRADUATE WORK

In order that the facilities of certain institutions of the State of Ohio may be utilized for the pursuit of research work in connection with the Graduate School of the University, certain agreements have been

made between the Board of Trustees of the Ohio State University and similar boards of Ohio University, of Miami University, and of the Ohio Experiment Station. Briefly, these agreements are as follows:

(a) With Ohio University and Miami University. Each of these Universities is represented upon the Graduate Council of the Ohio State University. It is agreed, however, that no graduate work will be offered by Ohio University and Miami University except that part-time assistants connected with the instructional staff of Ohio University or Miami University may pursue their graduate work for the Master's degree at these Universities, subject to the supervision of the Graduate Council of the Ohio State University, and upon the successful completion of the same will receive their degrees from Ohio State University.

(b) With the Ohio Experiment Station. Persons engaged in investigation at the Ohio Experiment Station may register in the Graduate School of the University and the research work carried on at the Station by such persons may be counted towards a graduate degree under appropriate restrictions. All such cases, however, shall be considered individual and subject to detailed examination on the part of the Graduate Council. It is possible for a student to complete his work for the Master's degree in residence at the Station alone. For the Doctor's degree he must spend at least one year in residence at the Ohio State University. In all cases, however, the work of the student is carried on under the general rules and regulations of the Graduate Council and the final examinations must be taken at the University in the presence of representatives of the Experiment Station staff and of the Graduate Council.

THE UNIVERSITY LIBRARY

The University Library consists of all books owned by the University and numbers approximately 250,000 volumes. The main part of the Library, which is known as the General Library, is housed in the Library building. Very important divisions of the book collection are housed in other buildings. A catalog of the entire collection is maintained in the General Library.

Any person is privileged to use the University Library for reference, but books may be drawn only by officers and registered students of the University.

The General Library is open from 7:30 a. m. to 9:30 p. m., Monday to Friday; Saturday from 7:30 a. m. to 5:30 p. m. Vacation hours are from 8 a. m. to 5 p. m. Monday to Friday; Saturday from 8 a. m. to 12 m. The Library is closed on legal holidays.

The University Library is a depository for the official publications of the United States and has a remarkably full collection of these documents. It also receives thousands of documents from states, cities and foreign countries. The exchanges of the Ohio Academy of Science, of the Ohio State University Scientific Association and of the Ohio Biological Survey are deposited in the University Library.

Of the department libraries five are organized divisions of the University Library, in charge of library assistants.

The Law Library is in Page Hall. It includes all of the United States and state reports, the English reports, the Irish reports, the latest statutes, codes and session laws of the states, complete sets of all the important legal periodicals and an up-to-date collection of textbooks. It is especially well equipped for the study of Ohio law.

The Medical and Dental Library is in the building of the College of Medicine on Park Street. This is a working collection of books, the historical books being shelved in the General Library.

Collections of books on Architecture, Engineering Drawing and Civil Engineering are located in a room in Brown Hall. This is known as the Brown Hall Library. The collection of plates, filed in this library, is especially valuable for the students in Architecture.

The Orton Memorial Library, located in Orton Hall, contains between 7000 and 8000 volumes. In addition, the Ohio Geological Survey deposits its document exchanges with the library. These two collections constitute a very complete set of official geological reports from the states, foreign governments and scientific societies.

The Botany and Zoology Library is located in the Botany and Zoology Building. It contains approximately 3500 volumes. The "Index to General Botanical Literature," the "Index to Algological Literature" and the card index of the Concilium Bibliographicum are in this departmental library.

Other departmental libraries, not yet thoroughly organized, are to be found in the Chemistry Building (The Charles Cutler Sharp Library), in Lord Hall, in Robinson Laboratory, in the College of Commerce and Journalism and in the Veterinary Laboratory. Smaller collections are connected with many of the departments.

The Library of the Ohio Archaeological and Historical Society, which is on the University Campus, is at the service of the officers and students of the University. This library is specializing in Ohio history and a very valuable collection is being built up.

REGISTRATION

REGISTRATION.—Under the Quarter plan each student will present his program of studies for only one Quarter at a time. During each Quarter certain days will be announced during which every student in residence will be required to file his program of studies for the following Quarter.

PROCEDURE FOR REGISTRATION

NEW STUDENTS.—Registration consists of the following steps in the order indicated:

(1) The student should secure

(a) An admission card from the University Examiner. (For necessary entrance credentials see page 18.)

(b) An election card or study-program card from the office of the Graduate School. This card must be approved by the Dean of the Graduate School and also by the Schedule Committee. (For details see page 19.)

(c) A fee card from the Registrar's Office. On this card the student will be assessed with all incidental, tuition, and laboratory fees. The fee card must be presented to the Bursar when the student pays his fees. All fees must be paid before the student will be admitted to classes.

(2) Every entering student must report for a physical examination upon the dates appointed. (See University Calendar, page 1.)

Men should report to the Director of Physical Education for Men, at the University Gymnasium.

Women should report to the Director of Physical Education for Women, at Pomerene Hall.

(3) Every entering student must report to the Department of Psychology for an intelligence test, upon the dates appointed. (See University Calendar, page 1.)

(4) Every woman student must register with the Dean of Women at her office in Pomerene Hall within twenty-four hours following her registration in the University.

(5) At the beginning of the year, each student shall give in writing his or her local address to the Registrar, and shall promptly report all subsequent changes of address.

Unless the student has followed the above instructions in every detail his matriculation in the University is not complete.

STUDENTS IN CONTINUOUS RESIDENCE.—Students who have been in continuous residence in the University will proceed as follows: They should secure

(1) An election card or study-program card, which must be approved by the Dean of the Graduate School and also by the Schedule Committee. This card may be obtained at the office of the Graduate School.

(2) A fee card, on which will be assessed all incidental, tuition, and laboratory fees. This card must be presented to the Bursar and all fees paid before the student will be admitted to classes. This card may be obtained at the Registrar's Office.

STUDENTS TRANSFERRING TO A COLLEGE IN THE UNIVERSITY.—A student who desires to transfer from the Graduate School to a college of this University must make his application for such transfer to the University Examiner. This transfer must be approved by the University Examiner before he will be permitted to proceed with his registration in the college which he is proposing to enter.

ABSENCES BEFORE OR AFTER A MID-QUARTER VACATION

A student absent without excuse from a scheduled hour of work on a day immediately preceding or following a mid-quarter vacation shall have a penalty of three hours added to the requirement for his graduation. This shall be entered on his official record. It shall be the duty of each instructor to report within five days all absences on such days to the Dean of the Graduate School. The authority for excusing students shall be the Dean. He may excuse a student for legitimate absence, and shall certify to the Registrar the penalty imposed upon unexcused students.

WITHDRAWAL FROM THE UNIVERSITY

A student who desires to withdraw from the University must make application to the Dean of the Graduate School for permission to withdraw in good standing. If the student leaves the University at any time during the Quarter, without communicating with the Dean, he will be marked as having failed in all of his courses for the Quarter and this will make it difficult for him to re-enter this University or gain admission to any other one. If a personal interview is impossible, the Dean should be notified by mail.

FEES AND EXPENSES

GENERAL CHARGES

All University fees must be paid at the opening of each Quarter as a condition of admission to classes. All registration fees, including laboratory deposits are assessed in the office of the Registrar and are paid in the office of the Bursar. Registration is not complete until all fees have been paid. No student will have any privileges in the classes or laboratories until all fees and deposits are paid.

Since all fees are due and payable as a part of the student's registration, no person should come to the University for registration without money sufficient to cover all of his fees and deposits.

Matriculation Fee—Every student upon his first admission to the University is required to pay a matriculation fee of \$10.00. This fee is paid but once and is in addition to other University fees and entitles the student to the privileges of membership in the University.

Non-Resident Fee—Every student who is not a legal resident of the State of Ohio is required to pay a non-resident fee of \$35.00 each Quarter of his residence in the University in addition to other University fees. The burden of registering under proper residence is placed upon the student. If there is any possible question of his right to legal residence the matter should be brought to the attention of the Registrar and passed upon, previous to registration or the payment of fees. Any student who registers improperly under this rule shall be required to pay not only the non-resident fee but shall be assessed a penalty of \$10.00. Students who do not pay this fee within thirty days after they have been notified that the non-resident fee has been assessed against them, will have their registration in the University cancelled.

No person shall be considered eligible to register in the University as a resident of the State of Ohio unless he has been a bona fide resident in the State twelve consecutive months next preceding the date of his original enrollment, and no person shall be considered to have gained or lost a residence in this State for the purpose of registering in the University by any conduct of his own while he is a student in the University; but persons whose legal residence follows that of other persons, as hereinafter provided, shall be considered to have gained or lost legal residence in this State for such purpose while students in the University according to changes of legal residence of such other persons, except that such legal residence shall not be considered to be so gained until twelve months after such other person becomes a legal resident of this State.

The residence of minors shall follow that of the legal guardian, regardless of emancipation; but in case a resident of Ohio is appointed guardian of a non-resident minor, the legal residence of such minor for the purpose of this rule shall not be considered to be established in the State of Ohio until the expiration of twelve months after such appointment.

The residence of wives shall follow that of husbands.

Aliens who have taken out their first citizenship papers and who have been residents of Ohio for twelve months next preceding the date of their enrollment in the University, shall be regarded as eligible for registration as residents of Ohio.

Incidental Fee—The fee for all students is \$15.00 each Quarter.

FEE FOR DUPLICATE FEE RECEIPT

A duplicate receipt for fees will be issued only upon presentation of satisfactory evidence of the loss or destruction of the original. A fee of \$1.00 will be charged for each duplicate receipt.

PENALTY FOR LATE REGISTRATION

All fees are due and payable by the close of the day preceding the first day of recitations. Failure to comply with this rule involves a penalty of \$5.00 for every succeeding day or fraction thereof.

A graduate student must pay his fees within twenty-four hours of the date of registration as certified by the Dean.

FEES FOR GRADUATE STUDENTS, SCHOLARS, AND INSTRUCTORS

Graduate students, with the exception of Graduate Assistants and Scholars, are subject to the same requirements relative to fees as undergraduates. Graduate Assistants and Scholars are not required to pay the incidental fee or the laboratory fees, but must pay the matriculation fee and the graduation fee.

A member of the teaching staff (above the grade of Student Assistant) who pursues courses for credit in the University is exempt from the payment of fees, provided the total of credit hours for such courses in any one Quarter does not exceed one-half of the total permitted to full-time students; but this exemption does not apply to laboratory supplies, diploma fees, nor to the tuition fee in a college having such a fee.

OTHER EXPENSES

THE OHIO UNION AND THE WOMEN'S UNION

A fee of \$1.00 each Quarter is paid by all students at registration. This entitles the student to all the privileges of the Unions consistent with the Constitutions and House Rules governing them.

GYMNASIUM FEE

Students taking gymnasium work are required to pay a gymnasium fee of \$1.00 each Quarter, which includes locker and towel service.

LABORATORY DEPOSIT

Students are required to pay for all materials consumed in laboratory work. To meet the cost of these materials a deposit ranging from \$2.00 to \$15.00 for each course requiring such supplies is made at the time of registration before the student can enter the laboratory. All laboratory supplies are sold at the Laboratory Supply Store, Chemistry Building, to students, at cost to the University, and charged against the deposit. Any unused part of the deposit will be refunded.

Instructors shall not permit students to engage in laboratory work unless first shown a receipt from the Bursar for deposits paid.

GRADUATION FEE

A special graduation fee is required of each person receiving a degree from the University. This fee must be paid *before* the student files his application with the Dean of the Graduate School as a candidate for a degree. This application must be filed within two weeks of the opening of the Quarter in which the degree is sought.

The fee for a master's degree is \$10.00.

The fee for a doctor's degree is \$10.00.

ROOMS AND BOARD

Furnished rooms can be obtained at prices varying from \$10.00 to \$15.00 a month. Board at the restaurants and boarding clubs near the University costs from \$6.50 to \$8.00 a week. The Ohio Union Commons offers board at reasonable rates. Board with furnished rooms can be obtained in private families at rates varying around \$10.00 a week.

REFUND ON FEES

If a student is forced to discontinue his connection with the University or to withdraw from a laboratory course during a Quarter, he must first secure permission from the Dean. On presentation of this permission the following refund of fees will be made:

On Tuition Fees. On application to the Bursar a refund will be made on tuition fees during the first thirty days of the Quarter.

Fees are not returnable except in case of sickness and causes entirely beyond the control of the student. No portion of the fees shall be returned for voluntary withdrawal of the student or enforced withdrawal thirty days after registration. Students withdrawing under discipline forfeit all rights to the return of any portion of the fees. In no case shall more than one-half the fee be refunded.

On Laboratory Deposits. On application to the Laboratory Supply Store, Chemistry Building, an order for refund may be obtained for the unexpended portion of the laboratory deposit. The refund will be paid at the Bursar's office on presenting the order for the same.

ASSISTANTSHIPS AND SCHOLARSHIPS

GRADUATE ASSISTANTSHIPS OPEN TO GRADUATE STUDENTS

In order to encourage graduates of this University and of other similar and approved institutions, especially those in Ohio, to continue their studies and to pursue advanced work leading to the higher degrees, the University has established graduate assistantships in several departments. Graduate Assistants are elected for the year (four Quarters). During three Quarters, generally the Autumn, Winter, and Spring Quarters, they must devote not to exceed one-half of their time in assisting in the work of the department in which they are pursuing their major work; during the remaining Quarter the Graduate Assistants are free to carry on their work at the University or elsewhere. Each Graduate Assistant must confer with the head of the department in which he is doing his major work concerning the Quarters that he must be in residence. A Graduate Assistant receives a stipend of \$500, payable in nine monthly installments during the three Quarters in which he is giving instruction. In addition, all fixed fees are remitted except a matriculation fee of \$10.00 in case the Assistant has never attended the University and a diploma fee of \$10.00 in case the Assistant receives a degree.

Appointments to assistantships are made annually in April or May. Students desiring such appointments can obtain application blanks by addressing the Dean of the Graduate School.

SCHOLARSHIPS AND FELLOWSHIPS

In addition to the graduate assistantships, a limited number of scholarships and fellowships have also been established. The scholarships are open to students having a baccalaureate degree from an approved institution, and have a value of \$300 with exemption from all fixed fees, except the matriculation fee and a diploma fee (\$10.00 each). The fellowships, on the other hand, are open only to students who have at least the Master's degree or its equivalent, and have a value of \$500 with like exemption from all fixed fees, except the matriculation fee and a diploma fee (\$10.00 each). Scholars and Fellows are selected on a basis of merit and must devote all their time to graduate work, including research. They are elected for the year, four Quarters, but are required to be in attendance only three Quarters, generally the Autumn, Winter, and Spring Quarters, during the year. Candidates for these positions should file their applications not later than March 1st. Application blanks may be obtained by addressing the Dean of the Graduate School.

THE STILLMAN W. ROBINSON FELLOWSHIP

This fellowship endowed by Stillman W. Robinson, late Professor of Mechanical Engineering, for the encouragement of graduate research in engineering, has a value of \$750 annually, and is open to graduates in mechanical, civil, and electrical engineering.

The holder of this fellowship must devote his entire time to graduate work. This should lead to the Master's or the Doctor's degree under the general regulations which obtain in reference to these degrees. For further information or for application blanks address the Dean of the Graduate School or the Secretary of the College of Engineering.

All applications should be filed with the Dean of the Graduate School not later than March 1st.

THE E. I. duPONT de NEMOURS FELLOWSHIP

Through the generosity of E. I. duPont de Nemours & Company of Wilmington, Delaware, and in recognition of the services of colleges and universities in training chemists for the emergency of the War, fellowships in chemistry have been established in a number of institutions, one of which is available at the Ohio State University.

The holder of the fellowship must be prepared to engage at once in active research upon a problem distinctly chemical in character, there being no further limitations upon the fellowship. The stipend is \$750 per annum, and it is expected that at the conclusion of the period the holder of the fellowship will be able to present his research as a thesis for the degree of Doctor of Philosophy. For further information or for application blanks address the Dean of the Graduate School.

All applications should be filed with the Dean of the Graduate School not later than March 1st.

THE GRASSELLI CHEMICAL COMPANY FELLOWSHIP

Through the generosity of the Grasselli Chemical Company of Cleveland, Ohio, a fellowship in chemistry has been established at the Ohio State University. This fellowship carries with it a stipend of \$750. An applicant for the fellowship must have had sufficient training in chemistry to enable him to begin at once active research work. If the applicant has not received the degree of Doctor of Philosophy then the research work accomplished may be presented as a dissertation for this degree.

No limitations are placed upon the fellowship other than that the Grasselli Chemical Company may request that the subject of the investigation be chosen from the field of organic chemistry rather than that of inorganic chemistry or vice versa.

Candidates for this fellowship should file their applications with the Dean of the Graduate School not later than March 1st. Application blanks may be obtained by addressing the Dean of the Graduate School, The Ohio State University.

OTHER FELLOWSHIPS

A number of other fellowships are also available, but these vary from year to year. The Bureau of Mines of the Federal Government has a branch station at the University, and for the present is offering three fellowships, each paying \$750. The National Limestone Association is also maintaining at the University a research fellowship.

ADMISSION

METHOD OF ADMISSION

The admission of students is in charge of the University Entrance Board, which determines the credits that shall be issued on all entrance examinations and certificates, and furnishes all desired information to applicants. Correspondence relating to admission should be addressed to the University Examiner, The Ohio State University, Columbus, Ohio.

REQUIREMENTS FOR ADMISSION

Admission to the Graduate School is open to all graduates of the Ohio State University as well as to the graduates of all other colleges and universities of approved standing. Before entering upon graduate work in any department, the applicant must present evidence to the effect that he has had the necessary prerequisite training that will enable him to pursue with profit the courses desired. *It must be remembered also that admission to the Graduate School does not imply admission to candidacy for the degree.* No graduate student, not even one who is a graduate of the Ohio State University, is admitted to candidacy for a degree until he has been in residence a sufficient time to enable his instructors to judge of his ability to carry on graduate work.

Information concerning admission to candidacy will be found under the title "Admission to Candidacy for a Degree."

A graduate of a college not on the approved list may be admitted to the Graduate School, provided that his college course, when checked by the University Examiner, entitles him to a credit of not less than one hundred and thirty-five Quarter-credit hours, or ninety semester hours. In all such cases, however, the residence requirement for the graduate degree will be correspondingly increased.

CREDENTIALS FOR ADMISSION

An applicant for admission to the Graduate School must first secure a statement from the registrar or other officer of the university or college of which he is a graduate, which contains the following information: (1) the date of graduation of the applicant; (2) the degree received; (3) the list of courses completed in those subjects which the applicant wishes to pursue in his graduate work. This statement, together with a catalog of the institution of which the applicant is a graduate, should be sent to the University Entrance Board not less than three weeks (an earlier date is preferable) before the opening of the Quarter in which the applicant expects to register. If the credentials are satisfactory, an

admission card to the Graduate School will be mailed promptly to the applicant. If the credentials are not satisfactory, or if further information is desired, the applicant will be notified at once by correspondence.

In case the applicant finds it impossible to present in advance the statement referred to in the preceding paragraph, he may present it in person on registration day and receive his admission card. However, the Entrance Board is always crowded with work on the opening days of the Quarters, so that the applicant will find it greatly to his advantage to secure his admission card in advance by correspondence.

REGISTRATION AND ASSIGNMENT OF STUDIES

The candidate should present his card of admission at the office of the Graduate School in Room 204, University Hall, on registration day. He will then receive an election card for presentation to the professor under whom he wishes to take his major work. This professor becomes the adviser of the student and will assist him in mapping out a suitable course of study. His work for the year, or for the degree in question, having been arranged in consultation with his adviser, the courses selected will be entered upon the election card, and this card, bearing the signatures of his instructors, thus indicating their approval of the courses selected, will be returned and left on file with the Dean of the Graduate School, who will issue to the student his fee and registration cards.

After a student's election card has been made out for the year, changes in his course of study will be made only upon the written request of the student's adviser, and the statement embodying the reasons for such changes must be left on file with the Dean of the Graduate School. No credit will be given on the University records for courses taken without the proper authorization. Registration should be completed as soon as possible after the opening of the Quarter. *In order to receive credit for work done, the student must have completed his registration within two weeks after the opening of the Quarter.* However, a student desirous of carrying on research work may be admitted at any time upon the recommendation of the professor in charge of the proposed work.

DEGREES CONFERRED

The following higher degrees are conferred by the University: Master of Arts, Master of Science, Master of Science in Public Health, Master of Science in Social Administration, Doctor of Philosophy.

ADMISSION TO CANDIDACY FOR A DEGREE

Any student wishing to obtain a graduate degree must apply at the appropriate time for admission to candidacy for the degree sought. Application blanks may be obtained at the office of the Graduate School. Admission to candidacy signifies that in the opinion of his instructors, the applicant has the necessary training and ability to pursue graduate study with profit and that he may expect to obtain the degree sought at

the time indicated if his work continues to be satisfactory. Further information concerning admission to candidacy will be found under the headings "Requirements for the Degrees of Master of Arts and Master of Science" and "Requirements for the Degree of Doctor of Philosophy."

GRADUATE STUDENTS NOT CANDIDATES FOR A DEGREE

Graduate students who are not candidates for a higher degree are not required to designate major or minor subjects, but may elect their work with a view to the special purpose for which they are in attendance at the University. Any course of study announced for advanced undergraduates and graduates is open for election by such students upon the same conditions that are imposed upon those who are candidates for degrees.

Should a graduate student who has not arranged his work with a view to obtaining a degree, subsequently desire to become a candidate for a degree, the amount of credit he is to receive for work already done will be determined at the time he applies for admission to candidacy for the degree.

STANDARDS OF WORK REQUIRED OF GRADUATE STUDENTS

The work of all graduate students performed in connection with the development of theses and dissertations is reported simply as "Prog" Progress. All other work is reported as "A" Excellent, "B" Good, "C" Average, "D" Poor but passing, "E" Failure.

A graduate student doing acceptable work must attain the mark "A" or "B" in not less than two-thirds of the work included in the course of study outlined for his graduate degree, and the mark of "C" or higher in the remaining one-third.

Any candidate for an advanced degree whose record is deficient under this plan is not admitted to the final examination for the degree sought, except by special action of the Graduate Council on request of the Committee in charge of the candidate's work.

REQUIREMENTS FOR THE DEGREES OF MASTER OF ARTS AND MASTER OF SCIENCE

In general, the degree of Master of Arts will be conferred for major work of a non-technical character, while the Master of Science degree will be conferred for major work of a technical character. The degree of Master of Arts will usually be conferred upon candidates whose major work lies in the departments properly included in the College of Arts, Philosophy and Science, the College of Education, or the College of Commerce and Journalism, while the degree of Master of Science will usually be conferred upon candidates whose major work lies in the College of Agriculture or the College of Engineering.

Residence Requirement. A residence of three Quarters wholly devoted to graduate work is required; but the graduates of this University may do not to exceed one-half of the required work at another institution having equivalent opportunities for study. The candidate is, however, subject to final examination by the Ohio State University on all work offered for the degree.

Students entering from other accepted graduate schools will be credited with work already completed, provided authorized statements are presented to the effect that such students have credit in the graduate school for the work specified. *However, no student will be given a degree by the Ohio State University unless he has been in residence at least three Quarters and has satisfactorily completed the equivalent of forty-five Quarter hours in this University.*

Course of Study. The course of study shall consist of one major and one or two minors, preferably one. The major and minor subjects must be under at least two different instructors and in lines of work distinct from each other. It is often possible for both the major and the minor work to be in the same department and yet fulfill the conditions given above. It is expected that the student shall devote about two-thirds of his time to his major subject and the remaining one-third to his minor. However, variations from this regulation may be made for valid reasons.

While qualification for the Master's degree is not contingent upon the completion of a definite number of hours of work, nevertheless, the amount of work required will usually aggregate not less than the equivalent of fifteen hours of classroom work throughout three Quarters, inclusive of the thesis.

Admission to Candidacy. Each candidate for a Master's degree must present his application for admission to candidacy at a date not later than the beginning of the Quarter in which the degree is sought. The applications are made upon special blanks secured from the office of the Graduate School. These applications are passed upon by the Executive Committee of the Graduate Council. Admission to candidacy is based upon undergraduate training and ability to pursue graduate work as revealed by the official reports upon the student's course. No student will be admitted to candidacy until he has completed at least the equivalent of one Quarter's work.

Examination. Each candidate is required to pass the regular final examinations upon all work included in his course with grades in accordance with the regulations of the Graduate School. There is also required an oral examination to test the candidate's knowledge of his major subject. This oral examination is conducted by a committee appointed by the Dean of the Graduate School. This committee is composed of the instructor under whom the candidate has prepared his thesis (Chairman), at least one member of the instructional force nominated by him, and a representative of the Graduate Council. The Chairman of this committee is responsible for the arrangement of the oral examination and for the certification of its results to the Dean of the Graduate School.

Thesis. A satisfactory thesis is required. The subject of the thesis, together with the written approval of the professor directing the work, must be filed at the office of the Graduate School at a date not later than that on which the candidate applies for admission to candidacy.

A candidate who expects to receive his degree at the end of a given Quarter must submit the completed manuscript of his thesis ready for typewriting to the member of the instructional staff who has directed the work, not later than three weeks prior to Commencement Day. If the manuscript is approved the candidate will then proceed at once to prepare two typewritten copies of the same, following specifications which may be obtained at the Editor's office. The thesis so prepared shall be presented for acceptance to the member of the instructional staff who has directed the work, at least one week prior to Commencement Day. If the thesis is then approved the student shall deposit it in duplicate with the University Editor not later than five days before Commencement Day, and shall pay to the Editor a fee covering the cost of binding the same.

In case the thesis has already been published, the candidate, instead of following the above procedure, may present two printed copies to the member of the instructional staff who has directed the work, not later than three weeks prior to Commencement Day. The form of printing as well as the contents must be approved by this instructor. If the thesis is so approved the student shall deposit these copies with the University Editor not later than five days before Commencement, and shall pay to the Editor a fee covering the cost of binding the same.

The thesis requirement may be waived by the Graduate Council upon the recommendation of the professor in charge of the major subject. In all cases where the requirement is waived action must be taken prior to the date for the filing of the thesis subject.

Diploma Fee. A fee of \$10.00 is charged each person receiving a graduate degree. This fee must be paid to the Bursar not later than two weeks after the beginning of the Quarter in which the candidate expects to obtain the degree.

GRADUATE COURSE IN PUBLIC HEALTH

This course leads to the degree of Master of Science in Public Health. The principal object of the course is to prepare young men and women for public health work; to fit them to occupy administrative and executive positions as health officers, members of boards of health, secretaries, agents, or inspectors of health organizations.

REQUIREMENTS FOR ADMISSION TO THE GRADUATE COURSE IN PUBLIC HEALTH

Graduates of any class "A" medical school will be admitted upon their record to the course in Public Health and registered as candidates for the degree of Master of Science. Any person holding the degree of

Bachelor of Arts or an equivalent degree from the Ohio State University or from any other institution of like standing will be admitted to the course in Public Health provided preliminary training has been taken in his collegiate course in each of the following subjects: chemistry (general and qualitative), 15 hours; physics, 10 hours; zoology (elementary), 5 hours; comparative anatomy (vertebrate), 5 hours; physiology, 10 hours; and bacteriology (general and pathogenic), 11 hours.

In order to meet these requirements graduates of the Ohio State University should have had the following courses, while graduates of other universities and colleges should have had their equivalents:

General Chemistry and Qualitative Analysis 401-402-403 or 411-412-413

General Physics 401-402 or 403-404

Elementary Zoology 401-402

Comparative Anatomy 401-402 or 406 (5 hours)

Physiology 403-404

General and Pathogenic Bacteriology 607, 608, 609

Students who do not expect to complete all the work required for the degree and who desire to fit themselves for some special field may be admitted to certain individual courses. See "Prerequisites for Graduate Work" in Public Health.

REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN PUBLIC HEALTH

The statements given above in reference to the residence requirement, admission to candidacy, examination, and thesis of all candidates for the degrees of Master of Arts and Master of Science apply also to candidates for the degree of Master of Science in Public Health. The course of study, however, is a fixed one and is as follows:

CURRICULUM IN PUBLIC HEALTH

Autumn Quarter	Winter Quarter	Spring Quarter
Public Health (802) 4	Public Health (801) 3	*Public Health (807) 2
Public Health Problems	Personal Hygiene	Demography
Public Health (809) 4	Public Health (803) 5	Public Health (817) 2
Communicable Diseases	Industrial Hygiene	Medical Aspects of
*Public Health (813) 4	Public Health (808) 2	Public Health
Public Health: Laboratory	Social Service and Public Health Nursing	Engineering
Civil Engineering (602) 5	Civil Engineering (703) 4	*Public Health (815) 4
Sanitary Engineering	Water Supply	Public Health: Laboratory
	Engineering	Public Health (816) 6
	*Public Health (814) 4	Major Research
	Public Health: Laboratory	

* Not given in 1924-1925.

GRADUATE COURSE IN SOCIAL ADMINISTRATION

The principal object of this course is to prepare men for administrative positions in social work such as the Administration of Financial Federations and Community Councils of Cities, and the executive positions of the Red Cross, State Boards of Administration, Charity Organization Societies, Community Welfare Organizations, Playground Associations, etc.

REQUIREMENTS FOR ADMISSION TO THE GRADUATE COURSE
IN SOCIAL ADMINISTRATION

In order to be admitted to this course students must have completed the undergraduate course leading to the degree of Bachelor of Science in Social Administration at the Ohio State University or a similar course offered at another approved institution. It is possible for such students to complete the course in one year.

Graduates of approved institutions who have not completed an undergraduate course in Social Administration, but who have had considerable training in Sociology, may also be admitted to the graduate course in Social Administration. Such students, however, will have to take a certain amount of additional work, the character and amount of which will depend upon their previous training, so that it will not be possible for them to obtain the degree of Master of Science in Social Administration in one year.

Students whose general education, maturity, and experience justify it, may be admitted to the course without becoming candidates for the degree and pursue subjects for which they are qualified.

REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE
IN SOCIAL ADMINISTRATION

This course for properly qualified students leads to the degree of Master of Science in Social Administration. To receive this degree students must be in residence at the Ohio State University at least one year. Upon the passing of an examination upon the subjects required and upon the completion of a satisfactory thesis, which is required of all candidates for the Master's degree, the degree of Master of Science in Social Administration will be conferred.

CURRICULUM IN SOCIAL ADMINISTRATION

Autumn Quarter		Winter Quarter		Spring Quarter	
Sociology	(881) 4	Sociology	(882) 4	Sociology	(883) 4
Administration of Social Agencies		Administration of Social Agencies		Administration of Social Agencies	
Sociology	(811) 8	Sociology	(812) 8	Sociology	(815) 4
The State and Social Welfare		Modern Social Welfare Movements		Community Organiza- tion	
Sociology	(821) 2	Sociology	(695) 8	Sociology	(816) 4
Graduate Seminary		Social Case Work		Community Surveys	
Electives	6	Sociology	(822) 2	Sociology	(696) 8
		Graduate Seminary		Social Case Work	
		Electives	8		

For those who for any reason do not follow the regular curriculum there are available the following courses for election: Public Health; Leisure and Recreation; Organization and Administration of Recreation Agencies; Criminology; Penology; the Handicapped, Defectives, Dependents; Needy Families and Children; American Race Problems; Municipal Sociology; Rural Social Institutions; Social Statistics.

REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

Residence Requirement. It is intended that this degree shall be given not as a certificate of faithful and industrious work for a specified length of time, but rather as an evidence of high attainments in scholarship and especially of an ability to carry on independent research in a chosen field. These qualities cannot be secured by less than three years of work devoted wholly to graduate study with suitable facilities and under proper supervision. Of these years at least one and that, except by permission of the Graduate Council, the last, must be spent in residence at this University. In case any part of the work is done elsewhere than in this University, such work shall be subject to the approval of the Graduate Council.

Course of Study. The course of study consists of one major and either one or two minor subjects, and must be approved as a whole by the Graduate Council upon the recommendation of a Committee designated by the Council from the professors in charge of the subjects proposed. Ordinarily, the major subject and at least one of the minors are in different departments. In special cases where the major work lies in a department which covers a broad field of study, such as the Department of Chemistry or that of Zoology and Entomology, the entire work for the Doctor's degree, by special vote of the Graduate Council, may be taken in one department.

In his major study the student is expected to become thoroughly familiar with the general results that have been obtained in the past and by leading contemporary investigators, as well as the methods of research by which these results have been obtained. The minor subjects are prescribed in order to guard the student against the dangers of overspecialization, and to secure for him the benefits to be derived from contact with other subjects and the personalities of other teachers. No choice of minors that disregards these ends will be approved by the Council, nor will one that goes to the other extreme in the selection of subjects which are not obviously related to the student's major work.

Language Requirement. A reading knowledge of two modern languages other than English, sufficient to enable the student to use these languages for the purpose of research in his major work, is required. These must be languages in which there exists a considerable body of works dealing with the student's major subject. Under normal circumstances they will be French and German, but the Graduate Council may permit a different selection upon the recommendation of the professor in

charge of the major subject. This professor may also, in case he judges it necessary, require a reading knowledge of one or more additional languages. The language requirements must be satisfied before the student is admitted to candidacy.

Admission to Candidacy. Not later than the end of the second week after the opening of the third Quarter previous to the date at which the candidate hopes to obtain his degree, he must file with the Dean of the Graduate School, on a blank provided for the purpose, a formal application for admission to candidacy. This application must indicate the candidate's choice of major and minor subjects, and the title of the proposed dissertation, and must bear the endorsement of the professor whom he desires to have placed in charge of his major subject.

Preliminary Examination. Upon receipt of the application for admission to candidacy, the Dean of the Graduate School shall arrange for the preliminary examination for the purpose of determining the student's acceptability as a candidate for the degree. This examination shall be conducted not later than the middle of the Quarter in which the application is presented and shall include the following:

First: The modern language requirement in case this requirement has not already been met. This examination shall be conducted by a Committee consisting of the head of the department in which the major subject lies, members representing the departments of modern languages, and one other member appointed by the Dean of the Graduate School.

Second: A test of the student's fitness to pursue his studies for the degree in the fields of study selected. This examination shall be conducted by a committee consisting of one or more representatives from each of the departments of the student's major and minor subjects. The members of the committee shall be designated by the Dean of the Graduate School. The examination may be partly or wholly oral. It shall not be regarded as final on any part of the work included in the candidate's course of study; it is conducted solely with the view of determining whether or not the student should be admitted to candidacy for the degree.

Final Examination. The final examination is divided into two parts, as follows:

(a) **Departmental Examination.** This examination is conducted by a committee, consisting of the professor in charge of the candidate's dissertation (Chairman), and one representative for each of the minor subjects. In large departments, one or more additional representatives of the major subject may be added. The personnel of this committee is fixed by the Dean of the Graduate School after consultation with the Chairman. It is the duty of the Chairman of the committee to call the committee together and arrange for the examination. The examination shall not be held until after the submission and approval of the disserta-

tion. It is expected that this examination shall be chiefly, if not wholly, written. The Chairman shall make a written report to the Graduate Council upon the method and results of the examination.

(b) Examination in Presence of Representatives of the Graduate Council. Upon presentation of evidence that the departmental examination has been passed satisfactorily, the candidate is then admitted to an oral examination conducted by the committee in charge of the departmental examination together with three (or more) representatives of the Graduate Council. The time and place of this examination shall be fixed by the Dean of the Graduate School.

Dissertation. A dissertation which shall make a definite contribution to knowledge of importance sufficient to warrant its publication shall be offered by the candidate. *A copy of this dissertation bearing the written approval of the instructor under whose direction the work was done must be presented to the Dean not less than four weeks previous to the end of the Quarter in which the degree is sought.*

The Dean, after consultation with the professor in charge of the major subject, shall then appoint a Committee to consider the merit of the dissertation. The dissertation, together with the report of this Committee, shall be laid before the Council, who will then vote upon the question of its acceptance.

Publication of the Dissertation. The regulations require that the candidate for the degree of Doctor of Philosophy must deposit in the office of the Graduate School one hundred copies of his dissertation, printed in acceptable form and complying with the specifications obtainable in the office of the Graduate School. If possible, these copies must be deposited not later than five days prior to Commencement.

If, for any reason, the candidate finds it impossible to print and deposit the one hundred copies of his dissertation before the Commencement Day on which he expects to obtain his degree, he may deposit in the office of the Graduate School duplicate copies of his dissertation, type-written and complying in form with specifications obtainable in the Graduate School office, together with an abstract of the dissertation not exceeding three thousand words in length. At the same time, as an evidence of good faith that the candidate will proceed with the publication of the dissertation at an early date, he must deposit with the Bursar of the University \$100.00 in cash. This sum will be returned as soon as the dissertation is printed and the one hundred copies of the same deposited in the office of the Graduate School. If, for any reason, the dissertation is not printed within a period of two years, then the University will proceed to print the dissertation in whole or in part, using the deposit to pay the cost of publication.

Diploma Fee. A fee of \$10.00 is charged each person receiving a graduate degree. This fee must be paid to the Bursar not later than two weeks after the beginning of the Quarter in which the candidate expects to obtain the degree.

COMMENCEMENT—CONVOCATION

A special Convocation or Commencement shall be scheduled at the close of each Quarter for the bestowal of degrees upon candidates who have fulfilled all the requirements of their respective courses.

PRESENCE AT COMMENCEMENT EXERCISES

All candidates for degrees are required to be present at the Baccalaureate and Commencement Exercises unless excused by the President.

Only those students who are to receive their degrees or certificates on Commencement Day may appear in the class procession on Baccalaureate Sunday or Commencement Day or be seated with the graduating class at the exercises on either of those days.

GRADUATE WORK IN THE SUMMER QUARTER

Candidates for the Master's degree may complete the residence requirement for such a degree by pursuing graduate work at the University for three full Quarters. For the benefit of those who cannot stay during the entire Summer Quarter, this Quarter is divided into two equal terms; and candidates for the Master's degree may complete their residence requirement by pursuing graduate work for *four* summer terms, provided that in the *ad interim* periods between the Summer Quarters a satisfactory amount of work is completed. This work, however, cannot be extended over a period longer than five years.

AD INTERIM WORK

No students are allowed to pursue *ad interim* work unless they have been in residence at least one term. Moreover, it is optional with any member of the instructional force as to whether or not he will conduct such work. The amount of such work that will be credited towards a Master's degree is limited to 15 Quarter hours, and the amount during any one *ad interim* period to 8 Quarter hours.

A student who wishes to pursue *ad interim* work will proceed as follows: At the close of the Summer term in which he is in residence he will obtain from the office of the Graduate School an appropriate card and, after consultation with the instructor in charge of the proposed *ad interim* work, will enter upon this card a brief outline of the work to be pursued in the *ad interim* period. After securing the signature of the instructor, thus signifying his approval to conduct the proposed *ad interim* work, the student will deposit this card in the office of the Graduate School. As an evidence of earnest intentions, he must also register in the University (this does not imply attendance) for at least one Quarter of each period during which the *ad interim* work is being pursued. He is also required to report to the instructor conducting his work at

least once a month and to pass such examinations as may be prescribed. He may secure from the University Library such books as may be necessary for the successful conduct of the work, but will be required to pay for the cost of shipment. Requests for such books should be sent to the Dean of the Graduate School.

THE LAKE LABORATORY

The Lake Laboratory at Put-in-Bay, Ohio, affords exceptional opportunities for graduate students in botany, entomology, and zoology during the summer. The general rules that apply to graduate work carried on at the University during the Summer Quarter apply equally to the graduate work taken at the Lake Laboratory. The work of instruction is carried on by members of the University Faculty and by members of the faculties of other colleges and universities. Students interested in this work should send to the University Examiner for the Lake Laboratory Bulletin.

THE PLANT INSTITUTE

The Plant Institute of the Ohio State University is an organization within the College of Agriculture for furthering research with plants. It affords graduate students the combined facilities of the departments of Botany, Horticulture, Farm Crops, Agricultural Chemistry, and Soils.

The instructional force and graduate students of these departments meet in a seminary for the discussion of problems connected with plant life.

The Institute, through its executive committee consisting of representatives from the several departments, reviews all thesis projects of candidates for higher degrees majoring in plant subjects in the departments of the College.

UNIVERSITY ORGANIZATIONS

There are a number of organizations in the University of especial interest to the graduate students. The Gamma Alpha Fraternity, the graduate scientific society, has its own house at which a number of the members of the society live and a still larger number board. There is also a Junior Open Court composed of not more than two representative members of the various departments; likewise the Graduate Club in social educational sciences, and the Women's Graduate Club.

The main object of all of these clubs is to bring members together for social purposes and for the discussion of the various problems in which the individual members are interested.

There are also chapters of the national honorary societies, Phi Beta Kappa and Sigma Xi, as well as a number of honorary fraternities. In addition to these, there are several departmental societies, such as the Biological Club, the Political Science Club, the Chemical Society, the History Club, and the English Club.

UNIVERSITY LECTURERS

Each year a number of lectures of special interest to graduate students are given by distinguished scholars from various educational institutions. Some of these lectures are of interest primarily to those in certain fields of work while others are of a general character and of interest to graduate students in general, no matter what their fields of activity may be.

THE APPOINTMENT COMMITTEE

In order to serve the schools of the State, the University Faculty has provided a committee, one of the duties of which is to assist graduates of the University to teaching positions for which they are best fitted. Any student of the University intending to teach is invited to enroll his name with the committee on a blank provided for that purpose by the committee. Graduates of the University who are already engaged in teaching are also cordially invited to correspond with the Appointment Committee with a view to bettering their positions. Correspondence is invited from boards of education and from superintendents and principals of schools in need of teachers. No fee is charged for the services of the committee.

DEPARTMENTS OF INSTRUCTION

ACCOUNTING

Office, Commerce Building

PROFESSOR G. W. ECKELBERRY, ASSISTANT PROFESSOR GREER,
MR. WALL, MR. BOLON

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: An acceptable course in the elements of accounting in addition to any prerequisites stated in the description of the courses. Course 606 requires as a prerequisite an acceptable course in economics.

601. Principles of Accounting. Five credit hours. One Quarter. Autumn, Winter, Spring. Five lectures and recitations each week. Mr. Eckelberry, Mr. Bolon.

The principles of modern accounting, especially those connected with the corporate balance sheet and income statement. Principles of valuation, treatment of capital stock and bond issues, surplus, goodwill, depreciation, etc.

This course is not open to students who have credit for Economics 191.

602. Principles of Accounting. Five credit hours. One Quarter. Autumn and Spring. Five lectures and recitations each week. Prerequisite, Accounting 601. Mr. Eckelberry.

The accounting procedure in connection with corporate reorganizations and dissolutions including the accounts and reports of receivers and trustees. Consolidated balance sheets and income statements, fiduciary accounting and foreign exchange accounting.

This course is not open to students who have credit for Economics 192.

603-604. Cost Accounting. Three credit hours. Two Quarters. 603, Autumn and Winter; 604, Winter and Spring. Three lectures and recitations each week. Prerequisite, Accounting 601. Mr. Greer.

Accounting 603: General methods of collecting costs of material, labor, and burden and incorporating them in the books of account. Cost control including the use of the perpetual inventory and various subsidiary ledgers.

Accounting 604: Various methods of distributing burden costs. Presentation of cost data. Studies and reports of cost accounting systems.

This course is not open to students who have credit for Economics 172.

605. Problems in Cost Accounting. Three credit hours. Autumn Quarter. Prerequisite, Accounting 604. Mr. Greer.

A study of some of the problems arising in connection with the installation of cost accounting systems. Systems prescribed by various manufacturers' associations are examined.

606. Institutional Accounting. Five credit hours. Winter Quarter. Three recitations and two two-hour laboratory periods each week. Open to students who are registered in Home Economics 631. Mr. Eckelberry.

This course is designed primarily for students expecting to enter the field of institutional management. The elementary principles of account construction are developed with special emphasis upon the interpretation and use of accounting reports and records for managerial control.

607-608. Auditing. Two credit hours. Autumn and Winter Quarters. Prerequisite, Accounting 603-604. Mr. Wall.

The various kinds of audits and their respective uses. Methods followed in verifying balance sheets and profit and loss accounts. Audit reports and certificates. Duties and responsibilities of an auditor.

This course is not open to students who have credit for Economics 174.

609. Industrial Auditing. Three credit hours. Winter Quarter. Prerequisite, Accounting 603-604. Not open to students who have taken or are taking Accounting 607 and 608. Mr. Greer.

The principles of auditing with particular reference to the accounts of manufacturing enterprises. Problems in connection with the verification of work in process and other inventories, proper valuation of plant and equipment, wasting assets, etc. Internal audits and methods of internal check are given special attention.

611. Income Tax Accounting. Two credit hours. Spring Quarter. Two hours of lectures, problems and recitations each week. Prerequisite, Accounting 601. Mr. Wall.

The accounting principles and procedure involved in the Federal taxes on income and profits. Practice in preparing income tax returns from the accounts of individuals, partnerships, and corporations.

This course is not open to students who have credit for Economics 129.

612. Constructive Accounting. Four credit hours. Spring Quarter. Four hours of lectures, problems, and recitations each week. Prerequisite, Accounting 603-604. Mr. Greer.

Practice in designing accounting systems for typical business enterprises.

This course is not open to students who have credit for Economics 173 or 193.

613-614. Accounting Practice. Four credit hours. Autumn and Winter Quarters. Four hours of lectures, problems, and recitations each week. Prerequisite, Accounting 603-604.

Practice in the solution of typical accounting problems. The class material is taken largely from the Certified Public Accountants' examinations of the various states.

This course is not open to students who have credit for Economics 173 or 194.

616. Business Statements. Three credit hours. Spring Quarter. Three hours of lectures and problems each week. Prerequisite, Accounting 601.

A study of the different kinds of statements prepared by corporations for the guidance of executives, directors, stockholders, and creditors. The methods used in preparing the necessary statements together with the principles of statement interpretation.

Use is made of current statements of well-known corporations. Lectures and problems.

This course is not open to students who have credit for Economics 189.

617. Managerial Accounting. Three credit hours. Spring Quarter. Three hours of lectures, problems, and recitations each week. Prerequisites, Accounting 603-604 and Economics 622. Mr. Greer.

The preparation and presentation of accounting reports to manufacturing executives. The interpretation of comparative statements. Sources of budgetary information and methods of budget control. The relation of the budget to the manufacturing and profit and loss statements, and balance sheet. Estimated balance sheets, and profit and loss statements.

FOR GRADUATES

801-802-803. Research in Accounting.

AGRICULTURAL CHEMISTRY

Office, 211 Townshend Hall

PROFESSORS LYMAN AND PHILLIPS, MR. ALMY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Acceptable courses in the elements of chemistry in addition to any prerequisites stated in the description of the courses. Course 602 requires also an acceptable course in organic chemistry and quantitative analysis, 607 an acceptable course in physiology, and 608 an acceptable course in animal husbandry.

601. General Biological Chemistry. Five credit hours. Autumn Quarter. Three lectures and two three-hour laboratory periods each week. Mr. Phillips.

A study of the chemistry of the fats, carbohydrates, proteins, and other compounds of biological importance, and the general chemistry of the metabolism of plants and animals. This course is intended for students majoring in biological subjects, and as a prerequisite to certain advanced courses in this department.

This course is not open to students who have credit for Agricultural Chemistry 111, 114, or 125.

602. Food Inspection and Analysis. Five credit hours. Autumn Quarter. One lecture and four three-hour laboratory periods each week. Mr. Almy.

Lectures on the composition of foods, methods of analysis, and the detection of adulteration in foods. Laboratory work includes the analysis of cereal foods, the use of the microscope in the detection of adulterants in spices, the identification of added colors, the detection and determination of chemical food preservatives, and the analysis of milk. This course is designed to give preparation for the analytical work connected with the state control of the sale of foods.

This course is not open to students who have credit for Agricultural Chemistry 121.

603. Food Inspection and Analysis. Five credit hours. Winter Quarter. One lecture and four three-hour laboratory periods each week. Prerequisite, Agricultural Chemistry 602. Mr. Lyman, Mr. Almy.

This is a continuation of Agricultural Chemistry 602. Laboratory work includes the analysis of edible fats and oils, sugars and syrups, vinegars, flavoring extracts, and beverages.

This course is not open to students who have credit for Agricultural Chemistry 122.

604. Dairy Chemistry. Five credit hours. Autumn Quarter. One lecture and four three-hour laboratory periods each week. Mr. Almy.

The constituents of milk are studied, using lectures, textbooks, and assigned readings. Laboratory work includes the separation and study of the constituents of milk.

This course is not open to students who have credit for Agricultural Chemistry 107.

605. Dairy Chemistry. Five credit hours. Winter Quarter. One lecture and four three-hour laboratory periods each week. Students are advised but not required to take Agricultural Chemistry 604 before taking this course. Mr. Almy.

Laboratory and lectures on the analysis of dairy products, milk, condensed milk, dried milk, and butter. This course is designed to teach the methods of analysis used in the chemical control of manufacturing plants and the legal control of dairy products.

This course is not open to students who have credit for Agricultural Chemistry 107.

606. Advanced Dairy Chemistry. Five credit hours. Spring Quarter. One lecture and four three-hour laboratory periods each week. Prerequisite, Agricultural Chemistry 605. Mr. Almy.

This is a continuation of Agricultural Chemistry 605. The analysis of ice cream and cheese is made and chemical problems involved in their manufacture considered. Food colors used in butter, cheese, and ice cream are studied. Flavoring extracts and ice cream improvers are analyzed.

This course is not open to students who have credit for Agricultural Chemistry 108.

607. Chemistry of Nutrition. Five credit hours. Winter Quarter. Two lectures and three three-hour laboratory periods each week. Mr. Lyman.

Lectures on the chemistry of nutrition. Laboratory work includes experiments on digestion and utilization of food, determination of fuel value of food and the heat production of man under various conditions, the analysis of blood for waste products of metabolism, the effects on small animals of diets consisting of purified food constituents, and the effects of selected diets on the formation of waste products in the body.

This course is not open to students who have credit for Agricultural Chemistry 126.

608. Animal Nutrition. Five credit hours. Winter Quarter. Two lectures and three three-hour laboratory periods each week. Prerequisite, Agricultural Chemistry 601. Mr. Lyman.

Lectures on the chemical problems involved in growth, maintenance and fattening of animals, and in the production of milk and work. The composition of feeds and farm rations is discussed from the standpoint of the more recent conception of animal nutri-

tion. Laboratory work includes the determination of coefficients of digestibility, the determination of protein and mineral storage during growth, a study of the energy requirement, and the effect of selected rations on animals.

This course is not open to students who have credit for Agricultural Chemistry 112.

FOR GRADUATES

Prerequisite for Graduate Work: For a student majoring in agricultural chemistry at least six Quarters of work in chemistry is required as a prerequisite. This work must include acceptable courses in general and organic chemistry and quantitative analysis.

801. Plant Chemistry. Five credit hours. Spring Quarter. Lectures and laboratory to be arranged. Prerequisite, Agricultural Chemistry 601 or its equivalent and the consent of the instructor. Mr. Phillips.

Lectures, laboratory, and collateral reading on special phases of the chemistry of plant metabolism.

802. Special Problems. Five to fifteen credit hours. Autumn, Winter, Spring Quarters. A total of fifteen credit hours may be obtained in this course by continuing the course for three Quarters. Laboratory, library, and conference work amounting to fifteen hours each week. Prerequisite, Agricultural Chemistry 601 and the consent of the instructor. Mr. Lyman, Mr. Phillips.

This course consists of studies of special methods, such as the separation of the fatty acids from a selected fat, the preparation of certain carbohydrates, or amino acids, the determination of the distribution of nitrogen in a protein by the Van Slyke method, or minor problems in animal or plant nutrition. The student will choose, with the advice of the instructor, the particular problem to be studied. This course is recommended as part of a minor toward an advanced degree.

803. Research. Five, ten, or fifteen credit hours. Any Quarter. Laboratory, library, and conference work. Prerequisite, consent of the instructor. Mr. Lyman, Mr. Phillips.

Research may be done in nutrition, plant chemistry, food analysis, or dairy chemistry.

804. Seminary. One credit hour. Autumn, Winter, Spring Quarters. Required of all graduate students majoring in agricultural chemistry. Mr. Lyman, Mr. Phillips.

AGRICULTURAL EDUCATION

Office, 209 Horticulture and Forestry Building

PROFESSOR STEWART, ASSISTANT PROFESSOR NISONGER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Acceptable courses in vocational agriculture.

601. Special Methods of Teaching Vocational Agriculture in Secondary Schools. Five credit hours. One Quarter. Autumn, Winter, Spring. Five recitations each week. Mr. Stewart.

An intensive application of the information and practices given in the preceding departmental courses to the preparation of material for specific agricultural courses. The organization of subject matter for effective presentation in the classroom, the planning of lessons, laboratory work, and field trips, the methods of teaching through project supervision, and the organization of part-time courses.

This course is not open to students who have credit for Agricultural Education 102.

602. History of Agricultural Education. Five credit hours. One Quarter. Autumn and Spring. Five recitations each week. Mr. Stewart.

A study of the development of agricultural education, including not only institutional development but also attending agencies, such as fairs, extension teaching, part-time instruction, etc.

603. Agricultural Education and the Vocational Education Movement. Five credit hours. Winter Quarter. Five lectures each week. Mr. Stewart.

A study of the development of agricultural education in its relation to the vocational education movement.

FOR GRADUATES

Special problems are designed particularly for the training of supervisors of agricultural education and trainers of teachers of vocational agriculture. In the study of special problems in the methods of observation of teaching vocational agriculture and in the methods of supervised teaching of vocational agriculture, opportunity will be provided for actual practice in conducting courses in observation teaching and supervised teaching in the department's training schools in out-lying villages. Opportunity for the study of special problems will be offered quarterly as enrollment for them demands.

801. Special Problems. Three to twelve hours as arranged. Autumn, Winter, Spring Quarters. Mr. Stewart, Mr. Nisonger.

Methods of observation teaching in agricultural education.

Methods of supervised teaching in agricultural education.

Special methods of teaching vocational agriculture.

Supervisors and the supervision of agricultural education.

Project organization and supervision in teaching vocational agriculture.

Visual education in teaching vocational agriculture.

Organization and methods of instruction in farm shop courses.

Organization and methods of instruction in part-time courses.

AGRICULTURAL ENGINEERING

Office, 200 Machinery Laboratory

PROFESSORS IVES, McCUEN, AND REED, ASSISTANT PROFESSOR POTTER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in agricultural engineering, mathematics, and physics. Course 604 requires also a course in soils.

602. Farm Structures. Five credit hours. One Quarter. Autumn and Spring. Two lectures, one recitation, and two three-hour laboratory periods each week. Mr. Ives.

A detailed study of farm buildings from the standpoint of economy, convenience, sanitary requirements, and appearance.

This course is not open to students who have credit for Agricultural Engineering 103.

603. Advanced Farm Power and Power Machinery. Five credit hours. Autumn Quarter. Two recitations and three three-hour laboratory periods each week. Mr. McCuen.

A study of economy, use and maintenance of the farm tractor; its operation in the field. Includes also a study of the care and operation of ensilage cutters, feed grinders, threshing machines, corn huskers, and other heavy-belt machinery.

604. Farm Drainage. Five credit hours. One Quarter. Autumn and Spring. Two lectures, one quiz, and two three-hour laboratory periods each week. Mr. Potter.

This course will include the systematic drainage of farm lands, grading, layout, ditching, inlets, outlets, culverts, etc.

Sufficient practice with surveying instruments will be given to enable the student to solve all ordinary drainage problems.

This course is not open to students who have credit for Agricultural Engineering 106.

605. Advanced Field Machinery. Three credit hours. Spring Quarter. One lecture and two three-hour laboratory periods each week. Mr. Reed.

A more detailed and complete study of field machinery than is possible in Agricultural Engineering 401. Designed for farm machinery users who want advanced work, for teachers, for those contemplating commercial work, and for those preparing for advanced special problems. Lectures, laboratories, quizzes, and field work.

This course is not open to students who have credit for Agricultural Engineering 110.

701. Special Problems. Three to fifteen credit hours, taken in units of three or five hours each Quarter for one or more Quarters. Autumn, Winter, Spring Quarters. All instructors.

Students selecting this course must have had at least two five-hour courses in the department, one of which must have been in line with the problem chosen. Consent of the department must be secured.

This course is not open to students who have credit for Agricultural Engineering 111-112.

FOR GRADUATES

Prerequisite for Graduate Work: Admission to graduate work in agricultural engineering will be granted only to those students having preparation in mathematics through calculus; ten hours of mechanics and strength of materials; and a baccalaureate degree in Agriculture, that shall include not less than thirty hours in agricultural engineering subjects.

801-802-803. Three to ten credit hours each Quarter. Autumn, Winter, Spring Quarters. Library, conference and laboratory work. Time to be arranged. Permission of the department required. Mr. Ives, Mr. McCuen, Mr. Reed, Mr. Potter.

AMERICAN HISTORY

Offices, 207 and 202 University Hall

PROFESSORS G. W. KNIGHT, HOCKETT, AND A. C. COLE, ASSISTANT PROFESSORS WITKE, HILL, AND STEPHENSON (UNIVERSITY OF MINNESOTA)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Four Quarters in the social science field, of which at least two must be in American history.

601. Introduction to Historical Research. Three credit hours. Autumn Quarter. Three meetings each week. Mr. Hockett.

Drill in finding historical material by the use of standard guides, manuals, and catalogs, followed by practice in criticizing material, and exercises in historical composition. Attention is given throughout to approved forms for note-taking, bibliographies, and citations of authorities.

This course is not open to students who have credit for American History 119.

602. Constitutional History of the United States to 1837. Three credit hours. Autumn Quarter. Three meetings each week. Mr. Hockett.

Constitutional ideas of Americans in the Revolutionary Period, the formation of the federal Constitution; constitutional questions involved in the organization of the government, party controversies, and foreign relations; relations between the federal and state governments; the great decisions of the supreme court under John Marshall; the Missouri Compromise; the nullification episode. Lectures, discussions, and reports.

This course is not open to students who have credit for American History 107.

603. Constitutional History of the United States since 1837. Three credit hours. Winter Quarter. Three meetings each week. American History 602 is a good foundation. Mr. Hockett.

Constitutional aspects of the slavery struggle, the Civil War and Reconstruction; questions relating to the power of Congress to regulate interstate commerce, levy an income tax, control trusts, etc.; constitutional problems resulting from the acquisition of territory in the War with Spain; recent amendments to the Constitution. Lectures, discussions, and reports.

This course is not open to students who have credit for American History 108.

604. The Slavery Controversy in the United States. Three credit hours. Autumn Quarter. Three meetings each week. Mr. Cole.

The ante-bellum South and its destruction; the Civil War in the light of the forces which tended to hasten or obstruct the clash of arms.

This course is not open to students who have credit for American History 111.

605. Reconstruction and the New South (1863-1920). Three credit hours. Winter Quarter. Three meetings each week. American History 604 affords a good foundation. Mr. Cole.

The aftermath of the slavery struggle as traced in the reconstruction of the Southern States and in the readjustment of society and of the states to the new status of the negro, and to the economic forces of the last half century. Lectures, discussions, and reports.

This course is not open to students who have credit for American History 112.

***606. American Diplomacy to the Close of the Civil War.** Three credit hours. One Quarter. Mr. Cole.

The foreign relations of the United States, beginning with the diplomacy which resulted in the establishment of independence and including such subjects as the struggle for neutral rights and commercial recognition, the extension of territory on the continent, the origin of the Monroe Doctrine, and the international controversies of the Civil War. Lectures, discussions, and reports.

This course is not open to students who have credit for American History 113.

608. Recent History of the United States (1875-1898). Five credit hours. Autumn Quarter. Four lectures and one quiz period each week. Mr. Knight.

An intensive study of the political, constitutional, industrial, and social life of the nation and states from the close of the Reconstruction Period to the Spanish-American War. It includes a consideration of new applications of the Constitution, industrial development, and third party movements. Lectures, discussions, and reports.

This course is not open to students who have credit for American History 123.

609. Recent History of the United States (1898-1921). Five credit hours. Spring Quarter. Four lectures and one quiz period each week. Mr. Knight.

An intensive study of the political, constitutional, industrial, and social life of the nation since the Spanish-American War. It includes the entry and participation of the United States in world politics, third party movements, rise of the new democracy, the World War and its aftermath as affecting this country. Lectures, discussions, and reports. This course is the natural continuation of American History 608.

This course is not open to students who have credit for American History 124.

610. The Teaching of American History. Three credit hours. Autumn Quarter. Three meetings each week. This course must be taken by all who expect to be recommended for teaching positions in the subject. Mr. Knight.

Lectures, readings, and quiz upon methods of teaching history in the secondary schools, schemes of courses, equipment, examination of textbooks; followed by practice work in the preparation of lessons for teaching, and the conduct of recitations in American history.

This course is not open to students who have credit for American History 121.

611. The Influence of Racial Groups on the History of the United States. Five credit hours. Spring Quarter. Four lectures and one quiz each week. Mr. Wittke, Mr. Stephenson.

The share of different racial groups in the building of America, from the colonial to the modern period, with special emphasis upon the contribution of the immigrant

* Not given in 1924-1925.

to American social and economic history, and his influence upon American politics. Lectures, discussions, and reports.

This course is not open to students who have credit for American History 133-134.

612. The Pioneer in American History to 1812. Three credit hours. Autumn Quarter. Mr. Hockett, Mr. Stephenson.

The westward advance of settlement from the Atlantic Coast, across the Alleghenies, into the Ohio Valley; the causes of the movement; the rise of new communities; the influence of western development upon national history and institutions. It is essentially a study of the development of American society. Lectures, discussions, and reports.

This course is not open to students who have credit for American History 115.

613. The Pioneer in American History since 1812. Three credit hours. Winter Quarter. American History 612 affords a good foundation. Mr. Hockett, Mr. Stephenson.

The progress of settlement in the Mississippi Valley; expansion to the Pacific; the territorial acquisitions; the fur trade of the far West; the discoveries of gold and silver; the extension of railways to the Pacific; the Indian Wars; the significance of the disappearance of the frontier; the irrigation and conservation movements. Lectures, discussions, and reports.

This course is not open to students who have credit for American History 116.

614. Great American Historians. Three credit hours. Winter Quarter. Mr. Hockett.

A study of the methods and works of Sparks, Prescott, Bancroft, Parkman, McMaster, Rhodes, and other leading writers of American history.

FOR GRADUATES

In accordance with the recent action of the Graduate Council, it is now permitted to offer history (including courses in both American and European history) as a major for the Master's or the Doctor's degree; it is still permitted, however, for the Master's degree, to offer American history or European history as either a major or a minor. Students who major in history, or who major in one history department and minor in the other, will be under the supervision of a joint committee of the two departments.

As is indicated by the courses in the following announcement, the University offers a large opportunity for graduate work in history. The University Library contains about 25,000 volumes on history, and about 10,000 additional volumes in parliamentary, congressional, and other records. Students have access also to large collections in the field of history in other libraries in the city, such as the State Library and the Library of the State Historical Society.

Prerequisite for Graduate Work: The courses named below presuppose good foundation courses of collegiate character in the history of the country from the early colonial period; also a good collegiate course in European history and English history. At least a fair knowledge of American political institutions is expected. As a qualification for the study of American history as a graduate major the student must previously have completed the equivalent of at least four Quarter-courses in the subject.

All of the following courses are conducted by the seminary method. They must be preceded or accompanied by American History 601.

HISTORICAL CONFERENCE: In addition to the formal courses indicated below, a monthly conference is held, composed of the instructors and graduate students in the departments of History and Political Science. The discussions in this conference

cover a wide range of topics of general interest to students and investigators in these fields.

802-803-804. Seminary in American History. Three credit hours. Autumn, Winter, Spring Quarters. This course must be preceded or accompanied by American History 601. All instructors.

A practice course in research in American history, with especial reference to the preparation of theses. At least three Quarters' work in the seminary are necessary to complete a thesis for the M. A. degree. Each student pursues his investigation under the supervision of that member of the department within whose field his topic falls, but all meet weekly for the discussion of reports.

Topics may be selected from the following fields of American History:

Constitutional History
Foreign Relations
Recent History
Westward Advance

Southern History
History of Ohio
Hispanic America

806-807-808. Advanced Research. Three to five credit hours. Autumn, Winter, Spring Quarters. Prerequisite, at least three Quarters in American History 801-802-803-804 or equivalent. Mr. Knight, Mr. Hockett, Mr. Cole, Mr. Wittke.

ANATOMY

Office, Hamilton Hall

PROFESSOR LANDACRE, ASSISTANT PROFESSORS BUCK, KNOUFF, AND
BAKER, MR. BRITT, MRS. SEARLES

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in biological science and anatomy in addition to any prerequisites stated in the description of the courses.

601-602-603. Seminary. One credit hour. Autumn, Winter, Spring Quarters. One conference each week. Required of all graduate students taking a major in anatomy. Mr. Landacre, Mr. Knouff, Mr. Baker, Mrs. Searles.

Lectures by members of the staff, conferences on investigations being carried on in the department, and reports on recent investigations in anatomy. Subjects for extended study will be changed from Quarter to Quarter.

This course is not open to students who have credit for Anatomy 111 or 112.

604-605-606. Advanced Comparative Anatomy. Three or five credit hours. Autumn, Winter, Spring Quarters. One conference and four or eight laboratory hours each week. Mrs. Searles.

Students will be assigned topics covering individual types, a system of organs in a series of types, or a problem on a single organ for extended study.

This course is not open to students who have credit for Anatomy 119-120.

***607. Comparative Neurology.** Five credit hours. Autumn Quarter. One lecture or conference and eight laboratory hours each week. Mr. Landacre.

The origin of the ganglia, central nervous system, and sense organs of the lower vertebrates.

This course is not open to students who have credit for Anatomy 109.

***608. Comparative Neurology.** Five credit hours. Winter Quarter. One lecture and eight laboratory hours each week. Mr. Landacre.

The reaction systems of the lower vertebrates with special reference to the interpretation of these systems in mammals.

This course is not open to students who have credit for Anatomy 110.

***609. Comparative Neurology.** Five credit hours. Spring Quarter. One lecture and eight laboratory hours each week. Mr. Landacre.

A study of the reaction systems in mammals with special emphasis on their phylogenetic origin.

This course is not open to students who have credit for Anatomy 109-110.

610. Cytology. Five credit hours. Autumn Quarter. One lecture and eight laboratory hours each week. Mr. Knouff.

The history of the development of cytological methods of investigation. Structural indications of the chemistry and physics of the cell. Microchemical technique.

This course is not open to students who have credit for Anatomy 113.

611. Cytology. Five credit hours. Winter Quarter. One lecture and eight laboratory hours each week. Mr. Knouff.

Early developmental phenomena including maturation, fertilization, and segmentation with special reference to the significance of nuclear phenomena in relation to genetics.

This course is not open to students who have credit for Anatomy 114.

612. Cytology. Five credit hours. Spring Quarter. One lecture and eight laboratory hours each week. Mr. Knouff.

Cytoplasmic relations and differentiations. The origin, significance, and staining reactions of mitochondria, secretion granules, fibrillae, and the differentiation of cytoplasmic structures in general as distinct from the nucleus.

This course is not open to students who have credit for Anatomy 113 or 114.

621. Human Anatomy. Five credit hours. Autumn Quarter. One recitation and four three-hour laboratory periods each week. Mr. Buck, Mr. Britt.

The gross anatomy of the abdomen and leg with the osteology of these parts.

This course is not open to students who have credit for Anatomy 121.

622. Human Anatomy. Five credit hours. Winter Quarter. One recitation and four three-hour laboratory periods each week. Mr. Buck, Mr. Britt.

The gross anatomy of the thorax and arm with the osteology of these parts.

This course is not open to students who have credit for Anatomy 121 or 122.

623. Human Anatomy. Five credit hours. Spring Quarter. One recitation and four three-hour laboratory periods each week. Mr. Buck, Mr. Britt.

The gross anatomy of the head and neck including the osteology and the gross anatomy of the central nervous system and sense organs.

This course is not open to students who have credit for Anatomy 122 or 136.

624. Histology. Five credit hours. Autumn Quarter. Two recitations, one lecture, and three three-hour laboratory periods each week. The lecture hour may be used as a seminary hour. Mr. Landacre, Mr. Knouff, Mr. Baker, Mrs. Searles.

The general histology of the tissues and the special histology of the circulatory, skeletal, muscular, respiratory, digestive, and urinary systems.

This course is not open to students who have credit for Anatomy 133.

625. Embryology. Five credit hours. Winter Quarter. Two recitations, one lecture, and three three-hour laboratory periods each week. The lecture hour may be replaced by a seminary hour. Prerequisite, Anatomy 624. Mr. Landacre, Mr. Knouff, Mr. Baker, Mrs. Searles.

The histology of the reproductive organs and the general embryology of the mammal, with special reference to man.

This course is not open to students who have credit for Anatomy 134.

626. Neurology. Five credit hours. Spring Quarter. Two recitations, one lecture, and three three-hour laboratory periods each week. The lecture hour may be replaced by a seminary hour. Prerequisite or concurrent, Anatomy 623. Mr. Landacre, Mr. Knouff, Mr. Baker, Mrs. Searles.

The histology of the central nervous system and sense organs, and the study of the human brain and spinal cord, with special reference to the reaction systems.

This course is not open to students who have credit for Anatomy 136.

627. Topographical Anatomy. Five credit hours. Autumn Quarter. Two lectures or recitations and nine laboratory hours each week. Prerequisites, Anatomy 621, 622, 623. Mr. Buck, Mr. Britt.

The topographical relations of gross anatomy with special reference to surgery, obstetrics, and the general surgical specialties.

This course is not open to students who have credit for Anatomy 127.

628. Special Advanced Anatomy. Three credit hours. Spring Quarter. One conference or lecture and six laboratory hours each week. Prerequisite, Anatomy 627 or its equivalent. Mr. Buck.

Students will select or have assigned to them special regions for dissection and study.

This course is not open to students who have credit for Anatomy 132.

FOR GRADUATES

Candidates for graduate degrees desiring to major in anatomy should present not less than four Quarters' work in biological science of which one or two Quarters must be in subjects listed in the Department of Anatomy.

Students majoring in anatomy as candidates for either the Master's or Doctor's degree must complete for the Master's degree one-half and for the Doctor's degree approximately one-third of their work in courses listed among those for advanced undergraduates and graduates, exclusive of those required in the College of Medicine.

For the present the Department of Anatomy is prepared to offer advanced students a choice of 607, 608, 609, or 610, 611, 612, or 801, 802, 803, or 804, 805, 806. All these courses cannot be offered simultaneously. The instructor in charge must be consulted but an effort will be made to group students with a view to meeting their needs.

801. Advanced Embryology. Five credit hours. Autumn Quarter. One conference and eight laboratory hours each week. Prerequisite, two years of biological science, of which one must be in anatomy or its equivalent. Mr. Landacre.

A student will be assigned a problem in some phase of vertebrate embryology. The Autumn Quarter will be devoted in part to the mastery of the literature on the subject assigned.

This course is not open to students who have credit for Anatomy 201.

802. Advanced Embryology. Five credit hours. Winter Quarter. One conference and eight laboratory hours each week. Prerequisite, Anatomy 801. Mr. Landacre.

The continuance of the problem assigned in Anatomy 801. The student should familiarize himself with the material of his problem.

This course is not open to students who have credit for Anatomy 202.

803. Advanced Embryology. Five credit hours. Spring Quarter. One conference and eight laboratory hours each week. Prerequisites, Anatomy 801 and 802. Mr. Landacre.

The completion of the problem assigned in Anatomy 801 with the presentation of results.

This course is not open to students who have credit for Anatomy 201 or 202.

804. Anatomical Problems. Five credit hours. Autumn Quarter. One lecture and eight laboratory hours each week. Prerequisite, two years of biological science, of which one must be in subjects listed in the Department of Anatomy. Mr. Landacre, Mr. Knouff.

The student will be assigned a problem in some subject in anatomy other than embryology. The Autumn Quarter will be devoted in part to a survey of the literature on the subject assigned.

This course is not open to students who have credit for Anatomy 203.

805. Anatomical Problems. Five credit hours. Winter Quarter. One lecture and eight laboratory hours each week. Prerequisite, two years of biological science, of which one must be in subjects listed in the Department of Anatomy. Mr. Landacre, Mr. Knouff.

The student may continue a problem assigned in Anatomy 804 or may be assigned a new problem in some subject in anatomy other than embryology.

This course is not open to students who have credit for Anatomy 204.

806. Anatomical Problems. Five credit hours. Spring Quarter. One lecture and eight laboratory hours each week. Prerequisite, two years of biological science, of which one must be in a subject listed in the Department of Anatomy. Mr. Landacre, Mr. Knouff.

The student may continue a problem assigned in Anatomy 804 or 805 or may be assigned a new problem.

This course is not open to students who have credit for Anatomy 203 or 204.

ANCIENT ART

(See Greek Language and Literature)

ANIMAL HUSBANDRY

Office, Judging Pavilion

PROFESSORS GAY, PLUMB, KAYS, AND COFFEY,
ASSISTANT PROFESSOR CONKLIN

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in animal husbandry in addition to any prerequisites stated in the description of the courses. Course 609 requires also an acceptable course in zoology.

601. Horse Production and Management. Five credit hours. Winter Quarter. Three lectures and two two-hour laboratory periods each week. Mr. Kays.

A consideration of the breeds and breeding, the feeding and management of horses in the stud and at work; the horse as a power unit. The laboratory exercises include practice judging and management sessions which are planned with the problems of the horse breeder and the employer of horse labor in mind.

This course is not open to students who have credit for Animal Husbandry 139.

602. Beef Cattle Production and Management. Five credit hours. Spring Quarter. Three lectures and two two-hour laboratory periods each week. Mr. Gay.

A general consideration of the breeds of beef cattle together with a study of the leading bloodlines, the history, adaptability, and economic importance of each breed. The management of pure-bred and commercial herds, the selection of feeders, and the feeding of steers under various conditions.

This course is not open to students who have credit for Animal Husbandry 141.

603. Swine Production and Management. Five credit hours. Spring Quarter. Three lectures and two two-hour laboratory periods each week. Mr. Coffey.

This course deals with the selection, feeding, and management of swine. In the lecture work about two-thirds of the time is devoted to feeding and management and the other one-third to bloodline discussions for the different breeds. In the laboratory

work the judging of individuals and breed type study occupies a major portion of the time. At least two rather extensive trips for purposes of visiting herds over the State will be required in this course.

This course is not open to students who have credit for Animal Husbandry 143.

604. Dairy Cattle Production and Management. Five credit hours. Autumn Quarter. Three lectures and two two-hour laboratory periods each week. Mr. Conklin.

A study of the history of each of the breeds together with the leading bloodlines that are producing cattle of outstanding individuality and heavy production; the adaptability and characteristics of each breed. Feeding and management of the calf, growing stock, and mature cattle; feeding for high production, fitting cattle for shows and sales.

This course is not open to students who have credit for Animal Husbandry 145.

605. Sheep Production and Management. Five credit hours. Spring Quarter. Three lectures and two two-hour laboratory periods each week. Mr. Plumb.

Text, supplemented by lectures, covers the breeds, breeding, feeding, wool production, and general management. The laboratory periods include practice in care and management of the flock on rather a wide basis, involving feeding, construction of equipment for the stable, treatment for diseases and parasites, butchering and cutting up the carcass, shearing, visiting the Ohio Sheep and Wool Growers' wool warehouse, judging, etc.

This course is not open to students who have credit for Animal Husbandry 147.

606. Advanced Live Stock Judging. Five credit hours. Autumn Quarter. Two four-hour and one two-hour laboratory periods each week. Prerequisites, Animal Husbandry 601, 602, 603, and 605. Mr. Kays.

An advanced class for Seniors who have had elementary work in judging and who desire additional judging experience. Type studies in case of horses, cattle, sheep, and swine, also practice judging in groups will occupy the time.

This course is not open to students who have credit for Animal Husbandry 151.

607. Meats and Meat Products. Five credit hours. Winter Quarter. Two lectures and three two-hour laboratory periods each week. Prerequisites, Animal Husbandry 602, 603, and 605 and permission of the instructor. Enrollment is limited to fifteen. Mr. Conklin.

A study of the composition and value of meats, the slaughtering of farm animals and the methods of handling and preparing meats and the by-products of slaughter. Particular attention is paid to the curing of pork. The relation of the live animal to the dressed carcass is also carefully considered.

This course is not open to students who have credit for Animal Husbandry 153.

608. Live Stock Markets and Marketing. Five credit hours. Autumn Quarter. Five lectures each week. Mr. Plumb.

The live stock markets, their organization methods and rules; methods of shipment and sale, etc. Considerable library work and investigation is required, and the course is handled after the manner of the seminary.

This course is not open to students who have credit for Animal Husbandry 155.

609. Breeding Live Stock. Five credit hours. Winter Quarter. Four lectures and one two-hour laboratory period each week. Mr. Gay.

The physiology of reproduction, growth, and development. Variation and heredity in their relation to live stock improvement; close breeding, cross breeding, and grading; prepotency, pedigree, and selection. Laboratory: Study of the methods and achievements of the master breeders; practice in tracing pedigrees; reports and discussions of assignments covering current events and research in the field of live stock breeding.

This course is not open to students who have credit for Animal Husbandry 157.

701. Special Problems. Three to fifteen credit hours. Given in units of three to five hours a Quarter, for one or more Quarters. Autumn, Winter, Spring. Open to graduate students majoring in animal husbandry. Mr. Gay, Mr. Plumb, Mr. Kays, Mr. Coffey, Mr. Conklin.

Special problems in any of the lines of animal production, or in breeding, feeding, and marketing live stock or meats. Students will elect work in desired subjects after conference with the instructor in charge.

This course is not open to students who have credit for Animal Husbandry 163 and 164.

NOTE: Students desiring work in animal nutrition, see Agricultural Chemistry 601, 607, 608.

FOR GRADUATES

Prerequisite for Graduate Work: As a prerequisite for a graduate major in this department the student must have had at least two years' study of the types and breeds of live stock, with collateral work in the principles of breeding and feeding.

801. Research Work. Three to fifteen credit hours, in units of three to five hours a Quarter, for one or more Quarters. Mr. Gay, Mr. Plumb, Mr. Kays, Mr. Coffey.

Research problems in any of the lines of animal production or in breeding, feeding, and marketing live stock or meats.

This course is not open to students who have credit for Animal Husbandry 201-202.

APPLIED OPTICS

Office, 206 Physics Building

PROFESSOR MINCHIN

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Acceptable courses in physics, mathematics, and applied optics in addition to any prerequisites stated in the description of the courses.

601. Advanced Applied Optics. Four credit hours. Autumn Quarter. Lectures and laboratory work. Mr. Minchin.

Theory and application of optical instruments used in practice. A discussion of thick lenses involved in such instruments.

Illumination and vision, color and color vision, principles of physiologic optics.

This course is not open to students who have credit for Applied Optics 151 and 152.

602. Advanced Applied Optics. Four credit hours. Winter Quarter. Lectures and laboratory work. Prerequisite, Applied Optics 601. Mr. Minchin.

A continuation of subject matter as given under Applied Optics 601.

603. Advanced Applied Optics. Four credit hours. Spring Quarter. Lectures and laboratory work. Prerequisite, Applied Optics 602. Mr. Minchin.

A continuation of subject matter as given under Applied Optics 601 and 602.

ART

(See Fine Arts)

ASTRONOMY

Office, Emerson McMillin Observatory

PROFESSORS LORD AND MANSON

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: An acceptable course in calculus in addition to any prerequisites stated in the description of the courses.

601. Practical Astronomy. Three credit hours. Autumn Quarter. The time is divided among lecture, quiz, and laboratory periods as seems convenient. Mr. Lord, Mr. Manson.

The course consists of a consideration of the problems of the determination of latitude, time and azimuth from observations of the stars or sun with enough astronomical theory to make possible an intelligent understanding of the methods used. A part of the laboratory work consists of the necessary observations of the stars and sun, and a part consists of reduction of these observations under supervision.

This course is not open to students who have credit for Astronomy 104.

602. Geodesy and Least Squares. Three credit hours. Winter Quarter. Three lecture or quiz periods each week. Mr. Lord, Mr. Manson.

A discussion of the method of least squares with special emphasis on its application to geodetic problems. Also a discussion of certain problems of geodesy; especially the calculation of geodetic positions.

This course is not open to students who have credit for Astronomy 105.

***603. The Theory of Lenses. Three or five credit hours. Winter Quarter. Mr. Lord.**

This course together with 604, which is a continuation of it, is a course in applied optics, beginning with the Gaussian theory of lenses and followed by a complete discussion to terms of the second order of spherical aberration, eccentric oblique refraction, coma (Von Seidel's second condition), distortion and achromatism; supplemented with laboratory practice in the design and construction of simple photographic lenses.

This course is not open to students who have credit for Astronomy 109.

***604. The Theory of Lenses. Three or five credit hours. Spring Quarter. Prerequisite, Astronomy 603. Mr. Lord.**

This is a continuation of Astronomy 603.

This course is not open to students who have credit for Astronomy 110.

605. Introduction to Celestial Mechanics. Five credit hours. One Quarter. Winter and Spring. Students electing Astronomy 605 are advised to take either before this course or concurrently with it a course in differential equations. Mr. Manson.

A discussion of rectilinear motion under the law of inverse squares and under the law of direct distance; central forces, including the character of the orbit under different laws of attraction; the potential and attraction of bodies; the problem of two bodies, including the computation of positions of planets and comets.

This course is not open to students who have credit for Astronomy 111.

606. Introduction to Celestial Mechanics. Five credit hours. Spring Quarter. Prerequisite, Astronomy 605 or equivalent. Mr. Manson.

A discussion of the determination of the orbits of planets and comets; the general integrals of the problems of "n" bodies and an introductory discussion of the problems of three bodies, lunar theory and perturbations.

This course is not open to students who have credit for Astronomy 112.

***607. Advanced Astronomy. Three or five credit hours. One Quarter. The time is divided among lecture, quiz, and laboratory periods as seems convenient. Students electing this course should consult the instructor regarding prerequisites. Mr. Lord, Mr. Manson.**

This course together with 608, which is a continuation of it, is designed for students who wish to take advanced work in astronomy other than that given in Astronomy 603-604 or in 605-606. The course will be adapted to the desires and capabilities of the students electing it. It might for example consist of work in practical astronomy beyond the scope of 601; or it might consist of lectures on and laboratory work with the spectroscope as applied to astronomical problems.

This course is not open to students who have credit for Astronomy 107.

***608. Advanced Astronomy. Three or five credit hours. One Quarter. Prerequisite, Astronomy 607. Mr. Lord, Mr. Manson.**

This is a continuation of Astronomy 607.

This course is not open to students who have credit for Astronomy 108.

* Not given in 1924-1925.

BACTERIOLOGY

Office, 202 Veterinary Laboratory Building

PROFESSORS MORREY AND STARIN, ASSISTANT PROFESSOR SPEER,
MR. JUKES**FOR ADVANCED UNDERGRADUATES AND GRADUATES**

Prerequisite for All Courses in This Group: Fundamental courses in chemistry and the biological sciences in addition to any prerequisites stated in the description of the courses.

607. General Bacteriology. Five credit hours. One Quarter. Autumn and Spring. Two class periods and three three-hour laboratory periods each week. Mr. Morrey, Mr. Speer, Mr. Jukes, and department assistants.

This course is a prerequisite to all elective courses in the department and is designed to prepare for special work. The lectures consider the botanical relationships of bacteria, their morphology, classification, effect of physical and chemical environment, action on food material, etc. The laboratory work includes preparation of the ordinary culture media and making of cultures on these media, staining methods, and some typical biochemical actions.

This course is not open to students who have credit for Bacteriology 107.

608. Pathogenic Bacteria. Three credit hours. Winter Quarter. Three class periods each week. Prerequisite, Bacteriology 607. Mr. Morrey.

A study of the more important bacteria producing disease in man; ways of transmission and methods of protection against infectious diseases; sanitation and the theories of immunity.

This course is not open to students who have credit for Bacteriology 108.

609. Pathogenic Bacteria. Three credit hours. Winter Quarter. Three three-hour laboratory periods each week. Prerequisite, Bacteriology 607. Mr. Morrey and department assistants.

Laboratory work on the more important bacteria producing disease in man, including cultural and staining properties, methods of diagnosis, animal inoculation.

This course is not open to students who have credit for Bacteriology 108.

610. Dairy Bacteriology. Three credit hours. Winter Quarter. Three class periods each week. Prerequisite, Bacteriology 607. Mr. Morrey.

Sources of bacteria in milk. Methods of avoiding them. Kinds of bacteria in milk. Abnormalities of milk and their prevention. Disease bacteria and milk. Uses of bacteria in butter making. Abnormalities of butter and their prevention. Uses of bacteria and fungi in cheese making. Abnormalities of cheese and their prevention. Bacteria in oleomargarine and ice cream.

This course is not open to students who have credit for Bacteriology 110.

611. Dairy Bacteriology. Three credit hours. Winter Quarter. Three three-hour laboratory periods each week. Prerequisite, Bacteriology 607. Mr. Morrey and department assistant.

Laboratory work on the organisms discussed in Bacteriology 610.

This course is not open to students who have credit for Bacteriology 110.

***612. Soil Bacteriology.** Three credit hours. Spring Quarter. Three class periods each week. Prerequisite, Bacteriology 607. Mr. Morrey.

Source and kinds of bacteria in the soil. Bacteria in relation to the nitrogen problem, ammonification, nitrification, nitrogen absorption, denitrification. Bacteria in relation to sulphur, to carbon, to phosphorus. Bacteria and mineral salts. Soil fertility and bacteria. Disease bacteria of the soil.

This course is not open to students who have credit for Bacteriology 112.

***613. Soil Bacteriology.** Three credit hours. Spring Quarter. Three three-hour laboratory periods each week. Prerequisite, Bacteriology 607. Mr. Morrey and department assistant.

Laboratory work on the organisms discussed in Bacteriology 612.

This course is not open to students who have credit for Bacteriology 112.

614. Water Examination, Sewage Disposal, Water Filtration. Three credit hours. Winter Quarter. Three class periods each week. Prerequisite, Bacteriology 607. Mr. Morrey.

A study of the organisms concerned in these processes. The modern water filtration and sewage disposal plants of the city of Columbus afford most excellent opportunities for practical demonstration and also for study of special problems.

This course is not open to students who have credit for Bacteriology 114.

615. Water Examination, Sewage Disposal, Water Filtration. Three credit hours. Winter Quarter. Three three-hour laboratory periods each week. Prerequisite, Bacteriology 607. Mr. Morrey.

Laboratory work on the organisms discussed in Bacteriology 614.

This course is not open to students who have credit for Bacteriology 114.

***616. Bacteriological Chemistry.** Three credit hours. Spring Quarter. Three class periods each week. Prerequisite, Bacteriology 607. Mr. Morrey.

Enzymes and the theory of their action. Technical uses of bacteria and fungi in the fermentation and allied industries.

This course is not open to students who have credit for Bacteriology 116.

* Not given in 1924-1925.

***620. Bacteriological Chemistry.** Three credit hours. Spring Quarter. Three three-hour laboratory periods each week. Prerequisite, Bacteriology 607. Mr. Morrey and department assistant.

Laboratory work in connection with Bacteriology 616.

This course is not open to students who have credit for Bacteriology 116.

617. Immunity and Serum Therapy. Three credit hours. One Quarter. Autumn and Spring. Three class periods each week. Prerequisites, Bacteriology 607, 608, and 609, or equivalents. Mr. Starin.

A discussion of the general principles of immunity, including toxins and antitoxins, bactericidal substances, agglutinins, precipitins, opsonins, etc.

This course is not open to students who have credit for Bacteriology 117 and 118.

618. Immunity and Serum Therapy. Three credit hours. One Quarter. Autumn and Spring. Three three-hour laboratory periods each week. Prerequisites, Bacteriology 607, 608, and 609, or equivalents. Mr. Starin and department assistant.

Laboratory work in the preparation of toxins, antitoxins, antibacterial substances, bacterial vaccines, and in the serological methods of diagnosis.

This course is not open to students who have credit for Bacteriology 117 and 118.

619. Pathogenic Protozoa. Three credit hours. Spring Quarter. Three class periods each week. Prerequisites, Bacteriology 607, 608, and 609, or equivalents. Mr. Starin.

The various protozoal diseases are considered, with special attention to trypanosomiasis, piroplasmoses, and spirochaetoses.

This course is not open to students who have credit for Bacteriology 119-120.

621-622-*623. Advanced Dairy Bacteriology. Five credit hours. Autumn, Winter, Spring Quarters. Prerequisites, Bacteriology 607, 610, and 611. Mr. Morrey.

Research in any of the lines discussed in Bacteriology 610.

This course is not open to students who have credit for Bacteriology 121-122.

625-626. Special Technique in Pathogenic Bacteriology. Five credit hours. Autumn and Winter Quarters. Conferences, library, and laboratory work. Prerequisites, Bacteriology 607, 608, and 609, or equivalents. Mr. Starin and department assistant.

A course in technique in which the student is thoroughly trained in working with such material and methods as are encountered in board of health and hospital laboratories.

This course is not open to students who have credit for Bacteriology 125-126.

627. Special Problems in Pathogenic Bacteriology. Five credit hours. Spring Quarter. Conferences, library, and laboratory work.

* Not given in 1924-1925.

Prerequisites, Bacteriology 607, 608, 609, 625, and 626 or equivalents. Mr. Starin.

628-629-*630. Advanced Soil Bacteriology. Five credit hours. Autumn, Winter, Spring Quarters. Prerequisites, Bacteriology 607, 612, and 613. Mr. Morrey.

Research in any of the lines discussed in Bacteriology 612.

This course is not open to students who have credit for Bacteriology 123-124.

FOR GRADUATES

Prerequisite for Graduate Work: Students intending to specialize in bacteriology should take, in addition, courses in botany, pathology, anatomy, physiology, zoology, dairying, or soils (subject depends on the line of specialization) and a second year in chemistry, which should include organic chemistry, if possible.

As a prerequisite to each of the following courses the prospective student must have had at least two years' work in bacteriology, one of which must have been along the lines of the course selected.

801-802-803. Research Work in Pathogenic Bacteriology. Five to ten credit hours. Autumn, Winter, Spring Quarters. Mr. Morrey, Mr. Starin.

804-805-*806. Research Work in Agricultural or in Technical Bacteriology. Five to ten credit hours. Autumn, Winter, Spring Quarters. Mr. Morrey.

BOTANY

Office, 102 Botany and Zoology Building

PROFESSORS TRANSEAU, SCHAFFNER, STOVER, AND SAMPSON,
ASSISTANT PROFESSOR WALLER, MR. TIFFANY, MR. SAYRE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in botany and biological science in addition to any prerequisites stated in the description of the courses. Courses 617, 633, and 634 require also a course in plant physiology; 655, 657, and 659 a course in plant pathology.

601. Plant Ecology. Five credit hours. Autumn Quarter. Three lectures and one four-hour laboratory period each week. Mr. Transeau, Mr. Sampson.

Lectures on the vegetation of the Eastern United States with special reference to the plant associations and formations of Ohio. Field work on the associations of the vicinity of Columbus and their successions. Reading of important literature.

This course is not open to students who have credit for Botany 117.

* Not given in 1924-1925.

602. Plant Ecology. Five credit hours. Spring Quarter. Three lectures and one four-hour laboratory period each week. Prerequisite, Botany 601. Mr. Transeau.

General principles of ecological plant geography. A discussion of associations and successions of the major divisions of the vegetation of North America. Assigned readings of the more important literature. Several Saturday field trips.

This course is not open to students who have credit for Botany 118.

***603. Ecological Anatomy.** Five credit hours. Spring Quarter. Three lectures and two two-hour laboratory periods each week. Prerequisite, four Quarters of botanical work.

A study of the tissues of the higher plants as modified by or as related to the environmental factors, water, light, temperature, etc. This course is a desirable antecedent to advanced work in ecology. Spring Quarter in alternate years.

This course is not open to students who have credit for Botany 108.

607. Principles of Taxonomy: Pteridophytes and Gymnosperms. Five credit hours. Autumn Quarter. Two lectures and six laboratory hours each week. Mr. Schaffner.

A detailed study of phylogeny and evolutionary series based on floral structure and organography.

This course is not open to students who have credit for Botany 129.

608. Principles of Taxonomy: Monocotyls. Five credit hours. Winter Quarter. Two lectures and six laboratory hours each week. Prerequisite, Botany 607. Mr. Schaffner.

A study of the groups of monocotyls with special consideration of the taxonomy of the grasses and of the lack of correlation between taxonomic characters and environment.

This course is not open to students who have credit for Botany 129.

609. Principles of Taxonomy: Dicotyls. Five credit hours. Spring Quarter. Two lectures and six laboratory hours each week. Prerequisite, Botany 608. Mr. Schaffner.

A general consideration of all the groups of dicotyls, of the origin of angiosperms, and of the progressive or serial development of characters.

This course is not open to students who have credit for Botany 130.

611. Evolution of Plants. Five credit hours. Autumn Quarter. Lectures and assigned readings. Mr. Schaffner.

The progress of evolution in the plant kingdom with a general discussion of the problems and factors involved, including both the scientific and philosophical aspects of the subject.

This course is not open to students who have credit for Botany 135-136.

617. Plant Microchemistry. Five credit hours. Autumn Quarter. One lecture and four two-hour laboratory periods each week. Desirable antecedents, general inorganic and organic chemistry. Mr. Stover.

* Not given in 1924-1925.

The identification *in situ* of organic and inorganic substances found in plant tissues by microchemical methods. These methods are of special value in determining plant substances within the cells and in the study of physical and chemical changes accompanying plant processes and plant responses. This applies particularly to the numerous local regions in plants too small to be attacked by the test-tube method of tissue analysis.

This course is not open to students who have credit for Botany 151.

619. Economic Botany. Five credit hours. Winter Quarter. Three lectures and two two-hour laboratory periods each week. Desirable antecedents, commercial geography and plant and animal ecology. Mr. Waller.

The world's food resources are examined in the light of botanical problems involving geographic distribution of economic plants. A summary is made of the centers of production of food-producing plants and the relation of these centers to natural plant formations is discussed. Trips to various industrial concerns utilizing plant materials are combined with laboratory examination of plant products.

This course is not open to students who have credit for Botany 155.

620. Economic Botany. Five credit hours. Spring Quarter. Four lectures and one two-hour laboratory period each week. Desirable antecedents, commercial geography and plant and animal ecology. Mr. Waller.

The fiber and oil producing plants and the forest products are discussed in this Quarter. The same ecological and economic principles discussed in the previous course are again applied, and an analysis is made of trade relations of the products to natural environmental factors governing the distribution of the plants. Visits are made to the industrial plants using the materials discussed.

This course is not open to students who have credit for Botany 156.

***633-634. Plant Growth.** Three credit hours. Winter and Spring Quarters. One lecture and two two-hour laboratory periods each week. Desirable antecedents, plant chemistry and microchemistry. Consult instructor before registering. Mr. Sampson, Mr. Sayre.

A study of the physiology of growth with special reference to the interrelations of the effects of internal and external factors upon growth, movement, and reproduction in plants. Work must be begun in Winter Quarter and no credit is given until the end of the Spring Quarter. Students must register for both courses.

***635. Experimental Plant Genetics.** Five credit hours. Spring Quarter. Two lectures and three two-hour laboratory periods each week. Mr. Schaffner.

Special emphasis will be placed on fluctuation and the varying expression of hereditary factors in respect to vegetative maturity, size, form, structure, and sexual states, through the influence of environment. Also problems of self and cross pollination and practical applications to selected types of economic plants. Spring Quarter in alternate years.

***640. Plant Anatomy.** Five credit hours. Autumn Quarter. Two lectures and three two-hour laboratory periods each week.

The origin and development of the organs, and tissue systems of vascular plants, and comparative study of the structures of roots, stems, leaves, flowers, and fruits. This course is a desirable antecedent to advanced work in physiology and pathology.

This course is not open to students who have credit for Botany 108.

* Not given in 1924-1925.

651. Methods in Plant Pathology. Five credit hours. Autumn Quarter. Two lectures and three two-hour laboratory periods each week. Prerequisite, Bacteriology 607. Mr. Stover.

This course presents the technique necessary for conducting research work on plant diseases, including the preparation of culture media, isolation and culture of bacterial and fungous parasites of plants, methods of inoculation, testing the pathogenicity of organisms, study of the development of plant disease, study of enzymes secreted by parasites, germination of fungous spores, sectioning and staining diseased tissue, the repositories of phytopathological literature, preparation of a bibliography and the review of the literature on a given subject, methods of keeping records, preparation of data and illustrations for publication, and the equipment and management of field laboratories.

This course is not open to students who have credit for Botany 127.

653. Mycology. Five credit hours. Winter Quarter. Three lectures and two two-hour laboratory periods each week. Mr. Stover.

A survey is given of the principal groups of the fungi, including a study of their structure, classification, cytology, reproduction, and life histories. Some attention is given to edible and poisonous mushrooms, to the fungi causing decay of timber, and to other fungi of economic importance, such as those causing fermentation, the ripening of cheese, the spoiling of food, and the diseases of fish, insects, and plants.

This course is not open to students who have credit for Botany 128.

655. Diseases of Fruit Crops. Three credit hours. Autumn Quarter. One lecture and two two-hour laboratory periods each week. Mr. Stover.

A study of the field, transportational and storage diseases of orchard fruits and small fruits with especial reference to the cause, symptoms, life history of the casual organism in relation to disease, and control measures.

657. Diseases of Garden Crops. Three credit hours. Spring Quarter. One lecture and two two-hour laboratory periods each week. Mr. Stover.

The diseases of the more important garden and truck crops are studied on the general plan followed in Botany 655. Attention is given also to the relation of various cultural practices to the occurrence of certain diseases.

659. Diseases of Farm Crops. Three credit hours. Winter Quarter. One lecture and two two-hour laboratory periods each week. Mr. Stover.

The diseases of the cereal, forage, and miscellaneous field crops are studied on the general plan followed in Botany 655.

***661. Advanced Mycology.** Five credit hours. Autumn Quarter. Two lectures and three two-hour laboratory periods each week. Prerequisite, Botany 653. Mr. Stover.

A more intensive study is made of the fungous groups, both in the field and laboratory, with considerable attention to the identification of species and to an acquaintance with mycological literature. The preparation of a herbarium is encouraged.

670. Advanced Plant Genetics. Five credit hours. Winter Quarter. Three lectures and two two-hour laboratory periods each week. Prerequisite, Botany 635. Mr. Schaffner.

* Not given in 1924-1925.

The principles and methods of plant genetics with a consideration of fluctuations, mutations, Mendelian phenomena and cytology, the nature of sexuality, and the relation of the plant life cycle to practical genetic problems. In alternate years.

This course is not open to students who have credit for Botany 121.

701. Minor Investigations: Taxonomy. Three or five credit hours. Mr. Schaffner, Mr. Transeau, Mr. Stover, Mr. Tiffany.

702. Minor Investigations: Morphology. Three or five credit hours. Mr. Schaffner.

703. Minor Investigations: Physiology and Ecology. Three or five credit hours. Mr. Transeau, Mr. Sampson, Mr. Sayre, Mr. Waller.

704. Minor Investigations: Pathology and Mycology. Three or five credit hours. Mr. Stover.

705. Minor Investigations: Economic Botany. Three or five credit hours. Mr. Waller.

FOR GRADUATES

Prerequisite for Graduate Work: Permission to major in botany will be granted only to those students who have had a thorough preparation in general botany, plant physiology, and plant morphology. Candidates for the degree of Doctor of Philosophy should have had courses in plant ecology, taxonomy, and plant pathology. Students majoring in plant pathology should have had acceptable courses in microchemistry, bacteriology, and plant genetics, in addition to the undergraduate courses in pathology. Advanced work in plant physiology presupposes at least an elementary course in organic chemistry.

For a number of special lines of work which may be elected as majors or minors in botany, unusual facilities are at hand for making advantageous combinations with other departments of the University. With plant physiology, suitable courses may be elected in physical and organic chemistry, and in soil investigations. With plant pathology, various courses in entomology and bacteriology are available and also in horticulture and soils. With morphology or taxonomy, related courses in zoology may be elected.

801. Research in Systematic Botany. Three to ten credit hours. Autumn, Winter, Spring Quarters. Laboratory open daily. Mr. Schaffner.

802. Research in Morphology and Cytology. Four to ten credit hours. Autumn, Winter, Spring Quarters. Laboratory open daily. Mr. Schaffner.

803. Research in Physiology and Ecology. Four to ten credit hours. Autumn, Winter, Spring Quarters. Laboratory open daily. Mr. Transeau, Mr. Sampson, Mr. Waller.

804. Research in Mycology and Plant Pathology. Four to ten credit hours. Autumn, Winter, Spring Quarters. Laboratory open daily. Mr. Stover.

805. **Research in Genetics.** Four to ten credit hours. Autumn, Winter, Spring Quarters. Laboratory open daily. Mr. Schaffner, Mr. Waller.

806. **Research in Economic Botany.** Four to ten credit hours. Autumn, Winter, Spring Quarters. Laboratory open daily. Mr. Waller.

810. **Botanical Seminary.** One credit hour. Autumn, Winter, Spring Quarters. Required of all graduate students majoring in botany. All instructors.

BUREAU OF EDUCATIONAL RESEARCH

Office, Balcony (East Wing) Orton Hall

PROFESSORS BUCKINGHAM AND ASHBAUGH, ASSISTANT PROFESSOR STEVENSON

The purpose of the Bureau of Educational Research is to promote the scientific investigation of educational problems both at the University and in the public schools of the State. It constitutes an agency for cooperative effort among all the school people of Ohio. The facilities of the Bureau are available to all students, faculty members, and school people of Ohio.

Library. The research library contains large quantities of material in the form of manuscripts, pamphlets, bulletins, reports, modern textbooks for elementary and high-school grades, and educational periodicals. This library is in charge of a reference librarian, and her services together with the library material will be utilized in the preparation of bibliographies and reports on problems presented by those engaged in educational work. This applies to students and faculty members as well as those engaged in the work of the public schools. Unless the problem requires extensive investigation, this service will be rendered gratis.

Courses. In order to make the resources of the Bureau serve for research purposes, students desiring to work in the Bureau may register in certain courses listed in the departments of School Administration, Psychology, and Principles and Practice of Education. Courses must be approved by the head of the particular department and by the Director of the Bureau. Such students will be under the direction and supervision of the Bureau staff.

Research Problems. Students taking such courses will be given a practical problem upon which to work. There will be no regular recitation periods, but the student will be in a position to confer with the Bureau staff whenever advisable. According to the nature and exacting character of the problem and the scholastic status of the student, he may be registered in either of two groups of courses, as follows:

MINOR PROBLEMS. Two to four credit hours. Investigation of minor problems.

Psychology 650

Principles and Practice of Education 650, 651, 652, and 653

School Administration 617, 618, 619, and 620

MAJOR PROBLEMS. Three or more credit hours. Investigation of problems leading to preparation of theses for advanced degrees.

Psychology 801

Principles and Practice of Education 850, 851, 852, and 853

School Administration 804, 805, 806, and 807

Descriptions of these courses will be found under the department announcements.

BUSINESS ORGANIZATION

Office, Commerce Building

PROFESSORS RUGGLES, HAGERTY, WEIDLER, FISHER, HOAGLAND, ECKEL-BERRY, AND MAYNARD, ASSISTANT PROFESSORS DICE, HELD, PIKE,

FITZGERALD, NELSON, AND DAVIS, MR. BECKMAN, MR. WEB-

STER, MR. RICHARDS, MR. CROXTON, MR. SHIVELY,

MR. SMART

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: A fundamental course in economics in addition to any prerequisites stated in the description of the courses. Course 692 requires also a course in engineering drawing.

604. Business Communications. Three credit hours. One Quarter. Autumn, Winter, Spring. Three recitations each week. Mr. Held.

The principles of effective writing; forms of correct expression; orders and acknowledgements; applications for positions; adjustment, credit, collection, and sales letters; forms and uses of direct-by-mail advertising.

This course is not open to students who have credit for Economics 114.

606-607. Secretarial Problems. Three credit hours. Winter and Spring Quarters. Prerequisite, the permission of the instructor. Mr. Held.

Duties and problems of secretaries of chambers of commerce, merchants' and manufacturers' associations, and organizations of similar nature, together with a study of the equipment of such offices.

614. Business Statistics. Three credit hours. One Quarter. Winter and Spring. Two lectures and one two-hour laboratory period each week. Prerequisite, Economics 622. Mr. Smart.

A more advanced and critical consideration of the methods used in statistical studies. Training in the construction of graphic charts; forecasting; interpretation; index numbers.

This course is not open to students who have credit for Economics 178.

***615. Industrial Statistics.** Three credit hours. Spring Quarter. Two lectures and one two-hour laboratory period each week. Prerequisite, Economics 622. Mr. Croxton.

A study of material, sources, and methods of particular value to industry.

This course is not open to students who have credit for Business Organization 614.

621. Business Law: Contracts. Three credit hours. One Quarter. Autumn, Winter, Spring. Mr. Pike and assistants.

A course in the law of contracts for the student of business. A study of the fundamentals of legally binding agreements between persons, and their enforcement; including a study of the making of the contract, consideration, the effect of fraud, duress, undue influence, mistake, illegality, and the statute of frauds, interpretation discharge and remedies.

This course is not open to students who have credit for Economics 149.

623. Business Law: Agency and Sales. Three credit hours. One Quarter. Autumn, Winter, Spring. Prerequisite, Business Organization 621. Mr. Pike and assistants.

A course in the law of agency and sales for the student of business. The fundamentals of the law governing business transactions of persons through agents and the sale of personal property. A continuation of Business Organization 621.

This course is not open to students who have credit for Economics 150.

625. Business Law: Negotiable Instruments. Three credit hours. One Quarter. Autumn, Winter, Spring. Prerequisite, Business Organization 621. Mr. Pike and assistants.

A course in the laws governing bills of exchange, promissory notes and checks designed to guide the business man in his daily transactions with such instruments.

This course is not open to students who have credit for Economics 149-150.

627. Business Law: Partnerships and Corporations. Three credit hours. Spring Quarter. Prerequisites, Business Organization 621 and 623. Mr. Pike and assistants.

A course designed to give the student of business a practical working knowledge of important laws governing the formation and operation of partnerships and corporations.

629. Business Law: Legal Aspects of Credits and Collections. Three credit hours. One Quarter. Autumn and Winter. Three recitations each week. Prerequisite, Business Organization 621. Mr. Pike.

The work includes in part a study of instruments of credit, forms of security, the pledge, real estate mortgage, chattel mortgage, conditional sale, laws governing their execution and priorities; legal instruments of collection, judgments, executions, judgment liens, mechanics and material men's liens; assignments for creditors, transfers in fraud of creditors, receiverships, bankruptcy, account books and other books as evidence, the bulk sales law, reports to credit agencies, laws of Ohio governing the execution and priorities of the various liens and other subjects mentioned.

* Not given in 1924-1925.

***631. Business Law: The Law of Banks and Banking.** Three credit hours. Winter Quarter. Three recitations each week. Prerequisites, Business Organization 621 and 625. Mr. Pike.

The work includes in part a study of the laws governing the bank and the borrower, the bank and the depositor, the bank and its customer; trusts, their creation and management, wills, estates, and probate practice, property and conveyancing, suretyship, statutes governing creation and operation of banks and trust companies, bank failures, stockholders, legal aspects of collateral security contracts and the sale of stocks and bonds, bankruptcy, etc.

640. Business Organization and Control. Three credit hours. One Quarter. Autumn, Winter, Spring. Three recitations each week. Mr. Hoagland, Mr. Richards, and assistant.

Business enterprise; types; structure; incorporation; charter; by-laws; security certificates; indentures; organization meetings; directors and officers; duties; obligations; committees; control by stockholders and bondholders; proxies; voting trusts; minority stockholders' rights; expansion; intercorporate relations; consolidations; methods; advantages and disadvantages; community of interest; contractual relationships; reorganization; liquidation; legislation and court decisions affecting organization and management of business; Federal Trade Commission.

This course is not open to students who have credit for Economics 183.

645. Trade Associations. Three credit hours. Winter Quarter. Three recitations each week. Mr. Nelson.

Nature and purposes of trade associations; historical evolution; types; organization (single associations, multiple secretaryships, federated associations, federations of associations); branches; methods of financing; functions (commercial, industrial, technical, statistical, protective, etc.); meetings; administration (qualifications of secretary, procedure, etc.); relations with labor, other industries, governmental agencies, etc.; Federal Trade Commission; laws and court decisions affecting trade associations.

650. Corporation Finance. Five credit hours. One Quarter. Autumn, Winter, Spring. Two lectures and three quiz periods each week. Mr. Hoagland, Mr. Nelson, Mr. Richards.

Financial structure and problems of modern business corporations; common types of securities; promotion, including parts played by promoter, investment banker and his organization, syndicate, security dealer; determination, management, and distribution of surplus; financial problems of expansion, including changes in financial plans; securing funds for expansion; failure of corporations and resulting reorganization or liquidation; financial results of reorganization.

This course is not open to students who have credit for Economics 163 or who are taking Economics 616.

652. Industrial Finance. Three credit hours. Spring Quarter. Three recitations each week. Prerequisite, Business Organization 650. Mr. Hoagland.

Obtaining funds for capital accounts; capitalization and valuation; factors governing financial plan; functions and methods of banking houses in financial corporations; syndicate operations; joint accounts, underwriting; wholesaler and retailer; security markets; working capital from banks, open markets, trade acceptance, miscellaneous sources; financial plan and purchasing, production, selling policies; subsidiaries; assumed obligations; financing mergers and consolidations; amortization; readjustments of capital account.

* Not given in 1924-1925.

656. Railroad and Public Utility Finance. Three credit hours. Winter Quarter. Three recitations each week. Prerequisite, Business Organization 650. Mr. Hoagland, Mr. Richards.

Financial problems peculiar to public utilities and railroads. Basis of investment; promotion; construction finance; supplementary capitalization; financing equipment; financial management; control of surplus; finance and accounts; intercorporate relationships; consolidations; collateral issues; pyramiding of capitalization; public utility holding company; insolvency; receivership; reorganization; financial problems of non-operating property; government regulation of security issues; government partnership; financial problems of government ownership and operation.

This course is not open to students who have credit for Economics 168.

658. Investments. Three credit hours. One Quarter. Autumn and Spring. Three recitations each week. Prerequisite, Economics 616 or Business Organization 650. Mr. Hoagland, Mr. Nelson.

This course covers the field of investment in a broad, general way. Students interested in more fundamental consideration of corporation investment problems should look to Business Organization 652 and 656.

Nature and laws of investment; mechanism, types, and tests; load factor; investment markets; economic conditions affecting investments; investment opportunities; classification of securities with respect to strategic positions as investments; security behind investments; allocation of earnings; methods of protecting investors; government securities; domestic and foreign; real estate mortgages; miscellaneous investments; financial news; sources of information; legal restrictions upon investments.

This course is not open to students who have credit for Economics 128.

659. Bond House Organization and Management. Three credit hours. Spring Quarter. Three recitations each week. Prerequisite, Business Organization 650. Mr. Hoagland.

Bonds as instruments of finance, public and private; growing importance of bond business; classes of bond houses; functions of bond houses—selective, distributive, protective—purchasing, selling, advisory; types and methods of organization; bond houses as fiscal agents; underwriting; syndicate formation and operation; bond houses as reorganization agents; organization operation; organization and operation of Investment Bankers Association and its branches.

660. The Stock Market. Three credit hours. Autumn Quarter. Three recitations each week. Prerequisites, Economics 610 and Business Organization 650. Mr. Dice.

The organization of the speculative security market; its relation with the banking community and with the public; the work of brokerage houses; the methods of speculation; public regulation of the exchanges; the movement of stock prices; business cycles in their relation to speculation and investment; the forecasting of stock market conditions.

This course is not open to students who have credit for Economics 127.

662. The Money Market. Three credit hours. Winter Quarter. Prerequisite, Economics 610. Mr. Dice.

A study of the development of New York as the money center of the United States; the work of the note broker; the commercial paper house; relation of the commercial paper house to the Federal Reserve System; interest and discount rates; movements of money. The significance of the money market to business; to the security

market, and to foreign exchange; a consideration of the factors that promote the development of a world money market.

665. Foreign Exchange. Three credit hours. Winter Quarter. Three recitations each week. Prerequisite, Economics 610. Mr. Dice.

A study of the theory and practice of foreign exchange; the supply and demand for exchange; rates of exchange; exchange quotations; commercial and bankers' bills; dollar credits; the development of a foreign exchange market; the organization and management of the foreign exchange department of a bank; the relation of the foreign exchange department to business; foreign exchange in relation to public policies.

This course is not open to students who have credit for Economics 154.

666-667-668. Practice Work in Banking. One to three credit hours. Autumn, Winter, Spring Quarters. Students are admitted on the suggestion of the instructor in charge in cooperation with the banks concerned. Mr. Dice.

Students taking this course will be engaged in actual work in a bank under the supervision of the head of the banking group. Each student will attend conferences in regard to his work and make reports based on the actual operations in the bank with which he is connected.

670. Bank Organization and Management. Four credit hours. Spring Quarter. Three recitations and one two-hour laboratory period each week. Prerequisites, Economics 610, Business Organization 650 and Accounting 601. Mr. Dice, Mr. Eckelberry.

The formation of banking institutions; organization of the different departments of a bank and the interrelation of such departments; credit problems and policies; management of loans, discounts, and investments; the banks' reserves; new business; the protection of deposits; the clearing system; application of the general principles of accounting and auditing to the peculiar problems of banking; books and records used; the construction of the accounts, their classification, and the preparation of statements and reports; the verification of balance sheet items, income, and expenses.

This course is not open to students who have credit for Economics 154.

680. Industrial Organization and Management. Five credit hours. One Quarter. Autumn and Winter. Three lectures and two conferences each week. Mr. Fisher, Mr. Lyons.

The organization and management of industries, history, literature, and theory of industrial management. Kind and internal development of organization, dealing particularly with problems or interrelation of functions and the general duties of various functions. A general survey of the problems of the manufacturing or industrial executive within an organization without entering into detailed studies of specific problems of manufacturing.

Besides lectures and conference work, a series of papers including a short-term paper will be required. These papers may call for a limited amount of outside investigation.

This course is not open to students who have credit for Economics 107-108.

684. Industrial Management Field Work. Four to six credit hours. One Quarter. Autumn, Winter, Spring. Prerequisite, Business Organization 680. Mr. Fisher, Mr. Lyons.

Field work. This work should be a regular, productive job in an industry. The job must carry the approval of the instructor and be followed by a report both from the employer and the student.

685. Material Organization and Management. Three credit hours. One Quarter. Autumn and Winter. Two lectures and one conference each week. Prerequisite, Business Organization 680 or 681. Mr. Fisher, Mr. Davis.

The organization and management of the problem of materials in industries. A study of the organization and functions of the purchasing, stores, stores controlling departments and that part of the planning, accounting, production, and other departments which directly affect the control of materials. The problems involved and accepted methods of handling and moving materials.

Students will be required to do field work involving visits and inspection of industries and to write constructive reports and a term thesis.

This course is not open to students who have credit for Economics 107-108.

686. Employment Organization and Management. Three credit hours. One Quarter. Autumn and Spring. Two lectures and one conference each week. Prerequisite, Business Organization 680 or 681. Mr. Fisher, Mr. Davis.

The organization and management of the employment department and the personnel problems within an industry. Deals particularly with the functions and problems which come within the scope of employment manager; such as, hiring, force maintenance, industrial education and welfare. Does not deal with questions of labor organization except in so far as is necessary for proper conception of these problems within an industry.

Students will be required to do field work involving visits and inspection of industries and to write constructive reports and a term thesis.

This course is not open to students who have credit for Economics 107-108.

687. Production Organization and Management. Three credit hours. One Quarter. Winter and Spring. Two lectures and one conference each week. Prerequisite, Business Organization 680 or 681. Mr. Fisher, Mr. Davis.

The problems of organization and management incident to the successful control of production in industry. Treats these problems largely from the point of view of a production manager. Coordinates personnel, equipment, and material to produce the necessary justification of organization in maximum production at least cost.

Students will be required to do field work involving visits and inspection of industries and to write constructive reports and a term thesis.

This course is not open to students who have credit for Economics 107-108.

691. Office Organization and Management. Three credit hours, or four credit hours if laboratory work is included. One Quarter. Autumn and Winter. Two lectures and one conference each week. Mr. Fisher, Mr. Davis.

Administration of offices. Methods of pay. Office manager. Standards, tools, forms, equipment, office machinery. Standard methods. Files, ticklers, mail handling, dictation, messengers. Engineering features. Special office problems of different departments.

Students will be required to do sufficient field work to write a term thesis based on actual investigation.

This course is not open to students who have credit for Economics 113.

692. Time and Motion Study. Three credit hours. One Quarter. Winter and Spring. Three recitations each week. Prerequisite, Business Organization 680 or 681. Mr. Davis.

Reviews methods of pay and of setting standards. Study of preliminary standardization. Observation work. Analysis of results. Fatigue analysis and other allowances. Setting tasks. Use of mechanical devices in time studies.

Course involves laboratory and field work to allow students to make studies under actual working conditions.

693. Cost Accumulation and Analysis. Three credit hours. Spring Quarter. Three recitations each week. Not open to students eligible to take Accounting 603-604. Mr. Fisher, Mr. Davis.

Deals with methods of accumulating direct and indirect cost data, the determination of the proper burden factor, the analysis of the resulting figures for engineers and executives, and balancing these figures with books of account. Deals with various reports and their practical use in increasing business efficiency.

This course is not open to students who have credit for Economics 130.

695. Problems in Employment Organization and Management. Three credit hours. Winter Quarter. Two conferences each week. Prerequisite, the consent of the instructor. Registration is limited to fifteen members. Mr. Davis and assistants.

An advanced course for students with a particular interest and aptitude in personnel organization and management. Problems, usually involving actual field investigation, will be assigned in such subjects as analysis of employment data, job analysis, labor turnover, training employees, force maintenance, hiring and firing, welfare, etc.

Definite assignments will be given to each student or group of students and these topics will be the subjects of reports, term theses, and class conferences.

696. Problems in Production, Organization, and Management. Three credit hours. Spring Quarter. Two conferences each week. Prerequisite, the consent of the instructor. Registration is limited to fifteen members. Mr. Fisher and assistants.

This course deals particularly with production from the point of view of production executives. Problems usually involving actual field work will be assigned in such subjects as storage, control and arrangement of materials; flow of production, factory layout, continuous vs. departmental manufacturing; production control, maintenance, etc.

697. Industrial Problems. Three credit hours. Winter Quarter. Two conferences each week. Prerequisite, the consent of the instructor. Registration is limited to fifteen members. Mr. Fisher and assistants.

This course is designed to deal with problems of general industry such as organization analysis, inter-departmental relations, industrial budgets, schedule building, etc.

Definite assignments will be given to each student or group of students and these topics will be the subjects of reports, term theses, and class conferences.

700. Marketing. Five credit hours. One Quarter. Autumn, Winter, Spring. Five hours lecture and quiz each week. Mr. Hagerty, Mr. Weidler, Mr. Maynard, Mr. Beckman.

The first part of the course will be devoted to the study of the marketing of raw materials, partially manufactured products and agricultural products. A critical consideration of marketing functions and institutions.

The second part of the course will be devoted to the study of the problems involved in marketing manufactured products. A study of the functions, methods, costs of marketing and marketing problems of the manufacturer, wholesaler or jobber, commission merchant, selling agent, broker, factor, and retailers of various types.

This course is not open to students who have credit for Economics 185-186.

702. Marketing Problems. Three credit hours. One Quarter. Autumn, Winter, Spring. Three hours lecture and quiz each week. Prerequisite, Business Organization 700. Mr. Hagerty, Mr. Weidler, Mr. Maynard, Mr. Beckman.

A consideration by the case or problem method of the marketing problems of manufacturers, jobbers, selling agents, commission merchants, factors, brokers, agents, retailers, including the newer types of retailers such as the chain store, the mail order house, the department store, etc.

Problems or cases involving the following will receive special consideration: market analysis, methods of distribution, price policies, brands, trade-marks, etc.

This course is not open to students who have credit for Economics 186.

705. Wholesaling and Retailing. Four credit hours. One Quarter. Autumn, Winter, Spring. Four hours lecture and quiz each week. Prerequisite, Business Organization 700. Mr. Weidler.

The organization and management of wholesale and retail establishments. Store location; store organization; buying; receiving; stock-keeping; inventories; store fixtures; sales systems; store policies; services; costs and profits; deliveries; market analysis; personnel problems.

This course is not open to students who have credit for Economics 110.

709. Credits and Collections. Three credit hours. One Quarter. Autumn, Winter, Spring. Three hours lecture and quiz each week. Prerequisite, Business Organization 700. Mr. Beckman.

The nature and functions of credit. Form of credit instruments; classes of credit; the credit manager; the credit risk. Sources of credit information; mercantile agencies; credit interchange bureaus; etc. Credit department organization and management. Collection methods and policies; collection correspondence; collection agencies and attorneys. Legal safeguards; extensions; composition adjustments; adjustment bureaus; receivership; bankruptcy, credit insurance.

712. Salesmanship. Three credit hours. One Quarter. Autumn, Winter, Spring. Three lecture and discussion periods each week. Prerequisite, Business Organization 700. Mr. Fitzgerald.

Knowledge of goods; prospecting; study of prospects or customers and their wants; buying motives; appeals to reason; appeals to instincts; planning a sale; attitude of buyers; sizing up a prospect; conducting a sales talk; meeting objections; closing the sale; qualities of a salesman; cultivation of personality, routine work of a salesman; survey of sales management practices as they relate to the salesman.

This course is not open to students who have credit for Economics 109.

716. Principles of Advertising. Three credit hours. One Quarter. Autumn, Winter, Spring. Three lecture and discussion periods

each week. Prerequisite, Business Organization 712. Mr. Fitzgerald, Mr. Shively.

The work of advertising; duties and methods of advertising departments and advertising agencies; securing and holding attention; headlines; effectiveness of different kinds of copy for the body of the advertisement; illustrative work; selection of type; color; display and form; laying out the advertisement; advantages of the leading forms of advertising; choice of media; testing values; costs of advertising; advertising campaigns; legal limits and restrictions on advertising.

This course is not open to students who have credit for Economics 175.

717. Advertising Practice. Three credit hours. One Quarter. Winter and Spring. Three lecture and discussion periods each week. Prerequisite, Business Organization 716. It is recommended that this course be preceded by Psychology 635. Mr. Fitzgerald, Mr. Shively.

This course offers opportunity for the further application of the principles of advertising to the advertising of selected products. The work covers study of the product, analysis of the market, selection of mediums, determination of appeals to be made and the amount of space desired, writing of copy, planning the type illustrations to be used, and laying out the advertisement.

This course is not open to students who have credit for Economics 175.

720-721. Exporting and Importing. Three credit hours. Autumn and Winter Quarters. Three hours lecture and quiz each week. Preferably preceded or accompanied by Economics 610 and Business Organization 700. Mr. Weidler.

Methods of conducting export and import business; foreign trade correspondence and advertising; market analysis; export commission houses and other sales agencies; handling shipments; credits and collections.

This course is not open to students who have credit for Economics 161-162.

727-728. Field Work in Marketing. Two credit hours. Winter and Spring Quarters. Prerequisite, permission of the instructor. Mr. Weidler, Mr. Maynard, Mr. Beckman.

Individual and group research in the fields of marketing, merchandising, advertising, and sales. This course is designed to give training in research and to offer an opportunity to students for investigation of the problem or problems of their future field of work.

730. Sales Administration. Three credit hours. One Quarter. Winter and Spring. Prerequisites, Business Organization 700 and 712.

Problems in sales management; sales organization; sales planning and research; sales policies; sales methods; selecting salesmen; training salesmen; determination of equipment; territories and quotas; compensation of salesmen; stimulation of salesmen; supervision of salesmen.

740. Railway and Public Utility Organization and Administration. Three credit hours. Winter Quarter. Three lecture and quiz periods each week. Prerequisite, Economics 618. Mr. Ruggles.

The development of railway and public utility organization. Government control of location and construction. Development of railroads and utilities and their functions. Inter-railway and utility relationships and their effect upon both rates and service.

Legislative, judicial, and administrative control of railroads and utilities. The effect of railway and public utility control upon the management of these industries.

This course is not open to students who have credit for Economics 168.

744. Port and Terminal Problems. Three credit hours. Spring Quarter. Three lecture and discussion periods each week. Prerequisite, Economics 618. Mr. Ruggles.

A study of the coordination of rail and ocean transportation; characteristics of properly coordinated port facilities; importance of ports as links in rail and ocean commerce; rail rates on exports and imports; policy of railroads concerning absorption of various terminal charges and its relation to terminal congestion; the need for unification of port facilities and services; the electrification of railroad terminal service; consideration of separation of freight rate for the line haul from the terminal charge; port organization and control and its relation to the present program of regulation by municipalities, states, and federal government.

745. Ocean and Inland Water Commerce and Transportation. Three credit hours. Autumn Quarter. Three lecture-discussion periods each week. Prerequisite, Economics 618. Mr. Ruggles.

A study of the development of ocean and inland water transportation; monopoly and competition; traffic and rate agreements and their effects upon commerce and industry in the United States; pools and conferences among ocean carriers; principles of ocean and inland water freight rates; effect of the policy of this country concerning freight rates on exports and imports and the influence of this policy on our foreign and domestic commerce. Consideration of exclusive contracts between ocean and rail carriers and the effect of such contracts on commerce through our ports; attention given to proposed plans of regulation of the volume of traffic through our various ports by application of freight rate differentials to the different ports; relation of distribution of commerce to ports to port congestion. Government aid and regulation of commerce and transportation.

748. Valuation and Rate Problems of Railroad and Public Utilities. Three credit hours. Winter Quarter. Three lecture and discussion periods each week. Prerequisite, Economics 618. Mr. Ruggles.

A study of the various methods of valuation including original cost, and different types of reproduction theories, with special reference to physical and non-physical elements, and their significance in determining reasonableness of rates, valuation for condemnation and for taxation. Study is made of typical valuation and rate cases before state public utilities commissions and before the Interstate Commerce Commission.

752. Traffic Management and Rate Making. Three credit hours. Winter Quarter. Prerequisite, Economics 618. Credit will be given for Business Organization 752 without taking 753. Mr. Ruggles.

The object of this course is to acquaint the student with the actual work of traffic departments of industries and carriers. A study is made of the principal routes of traffic in the United States including the recent development and significance of highway transportation; the relation of highway freight transportation to steam and electric railway transportation; the significance of hard surface roads and auto truck transportation to industrial development, commercial intercourse, organization and administration of traffic departments of industries, and to store door delivery of steam and electric railways. Special attention is given to bills of lading, routing of shipments, tracing of traffic, presentation and handling of claims, storage, demurrage, reciprocal demurrage and to switching service for shippers and for carriers. Study is made of rate cases which have come before the Interstate Commerce Commission since the Mann Elkins legislature of 1910; of the rules of the Commission concerning the compilation, filing,

and publication of rates; and of the principles followed by the Commission in rate cases. Emphasis is placed on industrial traffic problems in the first quarter and railway traffic problems in the second quarter. A special report is required of each student either in industrial traffic management or in railway traffic management.

This course is not open to students who have credit for Economics 188.

753. Traffic Management and Rate Making. Three credit hours. Spring Quarter. Prerequisite, Business Organization 752. Mr. Ruggles.

This is a continuation of Business Organization 752.

760. Life Insurance. Three credit hours. Winter Quarter. Three lecture and discussion periods each week. Mr. Fitzgerald.

Nature of life insurance; measurement of risk; net premiums; expense; reserves; surrender values and policy loans; surplus and dividends; needs of individuals; partnerships; and corporations for life insurance; kinds of policies for filling these wants; adaptation of insurance and annuities to individual cases; comparison of the policy provisions of various companies; disability, group, and fraternal insurance; kinds of companies; their organization and operation; agency, investments; state supervision.

This course is not open to students who have credit for Economics 157 or 624.

762. Fire and Marine Insurance. Three credit hours. Autumn Quarter. Three lecture and discussion periods each week. Mr. Fitzgerald.

Functions of fire insurance; relative merits of existing insurance organizations; agency; analysis and interpretation of the standard contract and the principal indorsing clauses; settlement of losses; protection of creditors; determination of rates; underwriters' associations and bureaus; fire prevention; state regulation. Character of perils of the sea; types of insurers against marine risks; agency; underwriters' associations; interpretation of the provisions of cargo, hull, and freight policies; kinds of losses and their settlement; special agreements.

This course is not open to students who have credit for Economics 158.

764. Casualty and Miscellaneous Insurance. Three credit hours. Spring Quarter. Three lecture and discussion periods each week. Prerequisite, one of the courses in insurance. Mr. Fitzgerald.

A study of the following lines of insurance: fidelity and surety; credit; title; accident and health; automobile; burglary and robbery; engine and equipment breakage; hail; inland transportation; liability; live stock; plate glass; rain; strike, riot, and explosion; tornado and windstorm; use and occupancy; leasehold, rent, and profits; and water damage and sprinkler leakage.

This course is not open to students who have credit for Economics 158.

766. Insurance Agency Organization and Methods. Three credit hours. Spring Quarter. Three lecture and discussion periods each week. Prerequisite, Business Organization 760, 762, or 764. Mr. Fitzgerald.

A study of the different types of agency organization; and of the different departments of a company; office organization and the division of responsibility; problems of agency from the standpoint of the agency manager and of the solicitor; study of the business with reference to methods of obtaining clients and adapting policy forms to buyers of insurance. The course is supplemented by special lectures by persons actively engaged in different phases of the insurance business.

This course is not open to students who have credit for Economics 112.

FOR GRADUATES

Prerequisite for Graduate Work: For major work in business organization a minimum of fifteen Quarter-credit hours and the consent of the instructor are required.

801-802-803. Research in Corporation Organization and Finance. One to three credit hours. Autumn, Winter, Spring Quarters. Mr. Hoagland, Mr. Nelson.

Individual investigations with group discussions participated in by those investigating related subjects.

805-806-807. Railway Service and Regulation. One to three credit hours. Autumn, Winter, Spring Quarters. Mr. Ruggles.

A study of railway service and its control in the United States and in European countries. Special consideration is given to control of railway service in the United States.

809-810-811. Public Utility Rate Making and Management of Public Utilities. One to three credit hours. Autumn, Winter, Spring Quarters. Mr. Ruggles.

A study of public utility rate making and the public utility management with special reference to conditions in the United States since the creation of public utility commissions.

814-815. Insurance Problems. One to three credit hours. Winter and Spring Quarters. Mr. Fitzgerald.

A problem which requires original work is assigned to each member of the class. As the information obtained from interviews, correspondence, and printed sources is obtained, it is given to the class in the form of a report. Finally, the information is presented in the form of a complete thesis.

817-818-819. Research in Marketing. One to three credit hours. Autumn, Winter, Spring Quarters. Mr. Weidler, Mr. Maynard.

Individual investigations with group discussion participated in by those investigating related subjects.

821-822-823. Research in Banking. One to three credit hours. Autumn, Winter, Spring Quarters. Mr. Dice.

The work under this head will consist of study made of special problems in the field of banking. Each student in conference with the instructor in charge will choose some problem along his line of interest. Large emphasis will be placed on field work. It is expected that each student make a more or less prolonged study of his problem, from time to time present the material he has gathered in the form of reports, and write a paper which shall represent the work complete.

824-825-826. Research in Advertising and Sales. One to three credit hours. Autumn, Winter, Spring Quarters. Mr.

Individual investigations with group discussion participated in by those investigating related subjects.

831-832-833. Graduate Seminary in Business Organization. Two credit hours. All instructors.

835-836-837. Research in Industrial Management. One to three credit hours. Mr. Fisher.

CERAMIC ENGINEERING

Office, 233 Lord Hall

PROFESSOR WATTS, ASSISTANT PROFESSOR HARROP, MR. ROBSON**FOR ADVANCED UNDERGRADUATES AND GRADUATES**

Prerequisite for All Courses in This Group: Fundamental courses in ceramic engineering in addition to any prerequisites stated in the description of the courses.

605. Bodies, Glazes and Color. Four credit hours. Winter Quarter. Four lectures each week. Prerequisite, Ceramic Engineering 615. Mr. Watts.

Ceramic bodies, glazes, and colors.

This course is not open to students who have credit for Ceramic Engineering 144.

610. Refractories and Furnaces. Five credit hours. Spring Quarter. Five lectures each week. Mr. Watts, Mr. Harrop.

Lectures on refractories, their physical and chemical compositions and properties, their utilization and testing. Mr. Watts.

Lectures on laboratory and industrial furnaces for high temperatures. Mr. Harrop.

This course is not open to students who have credit for Ceramic Engineering 146.

615. Ceramic Calculations. Five credit hours. Autumn Quarter. Five recitations each week. Mr. Robson.

Solution of chemical and physical problems involved in compounding ceramic mixtures, including wet blending. Also instruction in development of series, containing one, two, and three variables.

This course is not open to students who have credit for Ceramic Engineering 105.

620. Physical and Chemical Measurements of Clays and Other Ceramic Materials. Five credit hours. Winter Quarter. Two recitations and nine laboratory hours each week. Prerequisites, Ceramic Engineering 615 and Chemistry 681. Mr. Robson.

Application of physical chemical laws to ceramic materials and compounds.

Laboratory practice in determination of the essential physical and chemical properties of ceramic mixtures and compounds in the plastic, dry, vitrified, and fused states.

This course is not open to students who have credit for Ceramic Engineering 108.

701. Laboratory Work in Ceramics. Five credit hours. Autumn Quarter. One lecture, one quiz, and eight laboratory hours each week. Prerequisites, Ceramic Engineering 605, 615, 620. Mr. Watts, Mr. Robson.

Practice in the production of heavy clay wares, including the making of bodies, slips, engobes, and glazes. All ware is burned and tested.

This course is not open to students who have credit for Ceramic Engineering 111.

702. Laboratory Work in Ceramics. Five credit hours. Winter Quarter. One lecture, one quiz, and eight laboratory hours each week. Prerequisite, Ceramic Engineering 701. Mr. Watts, Mr. Robson.

Practice in the production of fine ceramic wares including the making of bodies and glazes. All ware is burned and tested.

This course is not open to students who have credit for Ceramic Engineering 112.

703. Laboratory Work in Ceramics. Five credit hours. Spring Quarter. One lecture, one quiz, and eight laboratory hours each week. Prerequisite, Ceramic Engineering 702. Mr. Watts, Mr. Robson.

Practice in the production of special ceramic wares, glazes and colors, including underglaze and overglaze colors. All ware is burned and tested.

This course is not open to students who have credit for Ceramic Engineering 112.

705. Ceramic Designing. Five credit hours. Autumn Quarter. One lecture, one quiz, and eight laboratory hours each week. Mr. Harrop.

Designing of clay plant structures and arrangement of machinery equipment. Practical problems in structural mechanics and in the handling of air for drying clay wares.

This course is not open to students who have credit for Ceramic Engineering 113.

706. Ceramic Designing. Five credit hours. Winter Quarter. One lecture, one quiz, and eight laboratory hours each week. Prerequisite, Ceramic Engineering 705. Mr. Harrop.

This is a continuation of Ceramic Engineering 705. Study of drying and burning problems and the design of driers and kilns.

This course is not open to students who have credit for Ceramic Engineering 114.

707. Ceramic Designing. Five credit hours. Spring Quarter. One lecture, one quiz, and eight laboratory hours each week. Prerequisite, Ceramic Engineering 706. Mr. Harrop.

This is a continuation of Ceramic Engineering 706. Design of power houses and complete clay plants.

This course is not open to students who have credit for Ceramic Engineering 114.

FOR GRADUATES

Prerequisite for Graduate Work: The courses offered presuppose good training in the fundamentals of inorganic chemistry, including qualitative and quantitative analysis, a knowledge of the general principles of ceramic technology, such as is given in the lectures of the second and third years of the course, a knowledge of mathematics through calculus and analytical mechanics, physics to the extent of a good year's course, with laboratory and problem work, and engineering drawing to enable free attack of original plans.

For major work a candidate must hold a baccalaureate degree in Ceramic Engineering.

801-802-803. Research Work. Three to ten credit hours. Autumn, Winter, Spring Quarters. Library, conference, and laboratory work. Time arranged with the instructor. Prerequisite, the permission of the instructor in charge.

Research work in analytical and physical chemistry of silicates is conducted under the supervision of Mr. Watts; in mineralogy and geology of clay deposits and testing of clays and clay products, under Mr. Watts; in the engineering and designing of structures for ceramic industries, under Mr. Harrop.

805-806-807. Testing of Clays With Reference to Their Industrial Adaptability. Two credit hours. Autumn, Winter, Spring Quarters. Mr. Watts.

810-811-812. Porcelain for Electrical and Other Special Purposes. Two credit hours. Autumn, Winter, Spring Quarters. Mr. Watts.

815-816-817. Advanced Experimental Work. Two to five credit hours. Autumn, Winter, Spring Quarters. Prerequisites, Ceramic Engineering 620, 703. Mr. Watts, Mr. Harrop.

This course is given to furnish opportunity for advanced studies along special lines or for investigations in the various fields of clay, cement, or glass manufacture.

CHEMISTRY

Office, 100 Chemistry Building

PROFESSORS McPHERSON, FOULK, HENDERSON, EVANS, AND WITHROW,
ASSISTANT PROFESSORS BOORD, HOLLINGSWORTH, MACK, FRANCE,
AND DAY, MR. FRITZ, MR. LOOKER, MR. VILBRANDT

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in general chemistry, qualitative analysis, quantitative analysis, and organic chemistry in addition to any prerequisites stated in the description of the courses. Course 681-682-683 requires also an acceptable course in physics.

621. Advanced Quantitative Analysis. Four or five credit hours. Autumn Quarter. One conference and nine or twelve laboratory hours each week. Mr. Foulk.

An extension of the first year's work in quantitative analysis. It includes such special methods as colorimetric, turbidimetric, and electrometric titration.

This course is not open to students who have credit for Chemistry 169.

622. General Quantitative Analysis. Three credit hours. Winter Quarter. Three recitations each week. Mr. Foulk.

The general principles used in developing methods of chemical analysis. The recitations are based upon assignments from one of the larger textbooks of quantitative analysis.

This course is not open to students who have credit for Chemistry 165.

623. Gas Analysis. Four or five credit hours. Autumn Quarter. One conference and nine or twelve laboratory hours each week. Mr. Hollingsworth.

An introductory course in gas analysis including some of its technical applications.

This course is not open to students who have credit for Chemistry 167.

624. Advanced Qualitative Analysis. Four or five credit hours. Spring Quarter. One recitation and nine or twelve laboratory hours each week. Mr. Hollingsworth.

The general system of qualitative analysis, as published by A. A. Noyes and his associates, forms the basis of this course. It includes the more abundant of the so-called rare elements, and emphasizes such points as the detection of small quantities of substances and rough estimates of the percentages present.

This course is not open to students who have credit for Chemistry 168.

625. Water Analysis. Five credit hours. Spring Quarter. Three lectures and six laboratory hours each week. Mr. Foulk.

The methods of sanitary and industrial water analysis and the interpretation of the analytical results; the principles of water purification.

This course is not open to students who have credit for Chemistry 176.

641. Qualitative Organic Analysis. Three credit hours. Spring Quarter. One lecture and six laboratory hours each week. Mr. Boord.

A study of the systematic classification of organic compounds with reference to methods of identification, and processes of separation, purification, and identification of organic compounds.

This course is not open to students who have credit for Chemistry 156.

642. Quantitative Organic Analysis. Three credit hours. Spring Quarter. One lecture and six laboratory hours each week. Mr. Boord.

Practice in the standard methods available for the quantitative analysis of organic compounds, including methods of combustion, together with the quantitative estimation of organic radicals present in various compounds.

This course is not open to students who have credit for Chemistry 155.

662. Advanced General Chemistry. Three credit hours. Winter Quarter. Three lectures or recitations each week. Mr. France.

An advanced course in general chemistry, stressing the more difficult topics touched upon in the more elementary courses.

This course is not open to students who have credit for Chemistry 114.

663. The Rare Elements. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Henderson.

A course of lectures on the chemistry of the less familiar elements, emphasizing their relations to the well-known elements, as well as their technical applications.

This course is not open to students who have credit for Chemistry 192.

672. Inorganic Preparations. Three credit hours. Spring Quarter. Nine laboratory hours each week. Mr. Mack or Mr. France, and assistants.

The methods employed in the preparation of purely inorganic compounds; the chief classes of such compounds; and the laboratory preparation of a number of examples sufficient to develop reasonable technique in applying the methods and to illustrate the classes.

This course is not open to students who have credit for Chemistry 187.

681-682-683. Physical Chemistry. Three credit hours. Autumn, Winter, Spring Quarters. Three lectures each week. Mr. Mack or Mr. France.

This is the fundamental course in physical chemistry, extending through three Quarters. This course is arranged for all students specializing in chemistry.

This course is not open to students who have credit for Chemistry 157-158.

691-692-693. Physical Chemistry: Laboratory. Two credit hours. Autumn, Winter, Spring Quarters. Six laboratory hours each week. Prerequisite or concurrent, Chemistry 681-682-683. Mr. Mack or Mr. France, and assistants.

These three courses constitute the elementary course in physicochemical measurements. Any one may be taken in any Quarter.

This course is not open to students who have credit for Chemistry 161.

695. Colloid Chemistry. Three credit hours. Winter Quarter. Three lectures or recitations each week. Prerequisite, Chemistry 681-682-683. Mr. France.

This course is a fundamental course in colloid chemistry.

696. Theoretical Electrochemistry. Three credit hours. Autumn Quarter. Three lectures or recitations each week. Prerequisite, Chemistry 681-682-683. Mr. France.

This course is a fundamental course in theoretical electrochemistry.

700. Elements of Chemical Engineering. Two credit hours. Winter Quarter. Mr. Withrow.

A thorough discussion of the fundamental principles underlying the engineering operations which constitute the body of chemical engineering as a branch of engineering. An introduction is given to the mechanical equipment which is used to carry out these engineering operations in the chemical industries. The relationship between chemical processes and the selection of engineering equipment to carry out the engineering operations demanded by these chemical processes is emphasized. The chemistry fundamental to or utilized by an industry is referred to as the basis which determines the engineering operations necessary in utilizing the chemistry for productive manufacture. The main detailed engineering operations taken up are transportation; storage; crushing and grinding; calcination; solution; mixing and agitation; classifying; the separation of solids from liquids by sedimentation, filtration, crystallization, refrigeration, precipitation, evaporation, distillation, and electrolysis; the separation of liquids from liquids; drying; absorption; and the special engineering manipulation required in highly standardized or individualized chemical processes such as gasification; hydrogenation; sulphonation, nitration, chlorination, reduction, cracking, hydroxylation, autoclaving, and impregnation.

701-702. Industrial Chemistry. Three credit hours. Autumn and Winter Quarters. Three lectures each week. Prerequisite, Chemistry 681-682-683. Mr. Withrow.

The fundamental lecture course in industrial chemistry, dealing with the problems of the chemical industries, and placing stress upon the economic questions involved in chemical manufacturing; materials of plant construction, as well as the engineering operations involved in chemical engineering, and the principles underlying the applications of chemistry to a selected number of chemical industries. The work of the Autumn Quarter deals especially with the inorganic industries, while that of the Winter Quarter is related to the organic industries.

This course is not open to students who have credit for Chemistry 177-178.

703. Inspection Trip to the East. Week of May 1, 1925, and odd-numbered years thereafter. Prerequisite, permission of the instructor. Mr. Withrow and assistants.

The trip includes Rittman, Akron, and Cleveland, Ohio; Buffalo, Niagara Falls, and Rochester, N. Y.; Pittsburgh and McKeesport, Pa. The entire expense need not exceed \$65.00. A satisfactory written report upon the work of the trip and an examination are required.

704. Inspection Trip to the West. Week of May 1, 1926, and even-numbered years thereafter. Prerequisite, permission of the instructor. Mr. Withrow and assistants.

The trip includes Dayton, West Carrollton, Hamilton, Cincinnati, and Ivorydale, Ohio; Kensington, Ill.; Gary, Grasselli, and Whiting, Ind.; Chicago and Argo, Ill.; and Toledo, Ohio. The entire expense need not exceed \$65.00. A satisfactory written report upon the work of the trip and an examination are required.

705. Written Reports. No credit hours. Spring Quarter. Prerequisite or concurrent, Chemistry 701-702. Mr. Withrow.

A substitute course for Chemistry 703 or 704, allowed only upon presentation of reasons satisfactory to the instructor in charge. The course consists of assigned reading designed to familiarize the student with all that can be found in the literature or plants regarding Chemical Engineering, and specified industrial chemical processes, together with a full written report.

706. Industrial Chemistry. Five credit hours. Autumn Quarter. One conference and fourteen laboratory hours each week. Prerequisite or concurrent, Chemistry 701. Mr. Withrow, Mr. Vilbrandt, Mr. Fritz, and assistants.

An introduction to industrial chemical research through assigned manufacturing problems. The specific problems are so chosen as to disclose the fundamental principles underlying the assigned industry, and practice is afforded in the preparation of written reports. Opportunity is given for study of operating efficiency of certain engineering equipment utilized in the fundamental engineering operations of chemical engineering. Weekly inspection trips are taken to plants in and around Columbus for study and report upon equipment and operation. Great emphasis is laid upon methods of attacking problems and upon report organization. Certain types of problems with engineering equipment, in factory research and in applied electrochemistry, are required of all students, after which opportunity is given the student to select special problems in various portions of the fields of industrial chemistry and chemical engineering such as absorption systems, filtration, petroleum and sugar technology, intermediates, wood distillation, insecticides, lime, chlorine, and plant fume questions.

This course is not open to students who have credit for Chemistry 185.

707. Industrial Chemistry. Three credit hours. Winter Quarter. One conference and eight laboratory hours each week. Prerequisite, Chemistry 706. Mr. Withrow, Mr. Vilbrandt, Mr. Fritz, and assistants.

This is a continuation of Chemistry 706 with additional laboratory work on technical methods of control, as applied to industrial chemical processes.

This course is not open to students who have credit for Chemistry 186.

710. Applied Electrochemistry. Three credit hours. Spring Quarter. Three lectures each week. Prerequisite, Chemistry 681-682-683. Mr. Fritz.

A survey of the electrochemical industries, and a discussion of the principles underlying the application of the electric current in chemical industries.

This course is not open to students who have credit for Chemistry 194.

781. The Teaching of Chemistry. Three credit hours. Spring Quarter. Three conferences each week. Mr. McPherson.

This course consists of reports upon assigned readings in educational journals; of discussions concerning the proper place of chemistry in school curricula, and of the methods of conducting lecture and laboratory work. Such subjects as the proper planning of laboratory, the purchase of materials, and similar problems confronting the teacher of chemistry are also discussed.

This course is not open to students who have credit for Chemistry 132.

782. Chemical Bibliography. One credit hour. Winter Quarter. One conference each week. Mr. Boord.

Designed to train the advanced student in the use of the chemical library, and to instruct him in the character of various chemical journals, dictionaries, reference books, and other sources of information pertaining to chemical subjects.

This course is not open to students who have credit for Chemistry 171.

783. Chemical Biography. One credit hour. Spring Quarter. One lecture each week. Prerequisite, Chemistry 681-682-683. Mr. Henderson.

Designed to familiarize the advanced undergraduate student with the leading personages in chemistry, particularly those of recent and contemporary times, as well as with the available sources of information relating to such personages.

This course is not open to students who have credit for Chemistry 173.

FOR GRADUATES

Prerequisite for Graduate Work: As a prerequisite for admission to graduate work in chemistry all students must have a thorough preparation in general inorganic chemistry, qualitative and quantitative analysis, and an introductory course in organic chemistry. In addition to the above, candidates for the degree of Doctor of Philosophy must have completed acceptable courses in physics and mathematics.

For all advanced courses in chemistry, particularly seminary courses, a reading knowledge of German and French is highly desirable if not necessary. Students deficient in this respect should consult at once with their advisers.

All candidates for the Master's degree taking major work in chemistry must complete the following general courses unless already credited with the same: Organic Chemistry (including laboratory), extending through the year; Inorganic Preparations 672, extending through one Quarter; Physical Chemistry 681-682-683; Chemical Bibliog-

raphy 782; and Chemical Biography 783. Additional courses must also be taken, the selection being subject to the approval of the department.

All candidates for the degree of Doctor of Philosophy taking major work in chemistry must complete the following courses in addition to those specified for the Master's degree: Historical Chemistry 930; Physical Chemistry 691-692-693 and 861. Quantitative Analysis 622; Organic Chemistry 641. These are simply the fundamental courses required of all candidates. Additional courses in the particular field in which the candidate is specializing, including the research work, must also be taken, the selection being subject to the approval of the department.

821. Seminary in Precise Chemical Measurements. Three credit hours. Autumn Quarter. Three conferences each week. Prerequisites, acceptable courses in analytical, organic, and physical chemistry. Mr. Foulk.

Conferences and reports upon topics chosen from the field of precise chemical measurements.

822. Seminary in Analytical Chemistry. Three credit hours. Winter Quarter. Three conferences each week. Prerequisites, fundamental courses in analytical, organic, and physical chemistry. Mr. Foulk.

Conferences and reports upon topics along the line of applications of general chemical principles to analytical problems.

841. Advanced Organic Chemistry. Three credit hours. Autumn Quarter. Three lectures each week. Prerequisites, acceptable courses in organic chemistry including laboratory work. Mr. Boord.

An advanced course in the fundamental principles of organic chemistry covering the chain hydrocarbons and their derivatives.

This course is not open to students who have credit for Chemistry 203.

842. Advanced Organic Chemistry. Three credit hours. Winter Quarter. Three lectures each week. Prerequisites, satisfactory courses in organic chemistry including laboratory work. Mr. Boord.

This is a continuation of Chemistry 841, covering the carbocyclic, including aromatic, hydroaromatic, and terpene derivatives, and heterocyclic compounds.

This course is not open to students who have credit for Chemistry 204.

844. Advanced Organic Preparations: Laboratory. Three or five credit hours. Autumn Quarter. Nine or fifteen hours of library, conference, and laboratory work each week. Prerequisite or concurrent, Chemistry 841. Mr. McPherson, Mr. Boord.

An advanced course in the synthesis of aliphatic organic compounds that involve difficulties, special stress being placed upon yield and purity of products.

This course is not open to students who have credit for Chemistry 205.

845. Advanced Organic Preparations: Laboratory. Three or five credit hours. Winter Quarter. Nine or fifteen hours of library, conference and laboratory work each week. Prerequisite or concurrent, Chemistry 842. Mr. McPherson, Mr. Boord.

This is a continuation of Chemistry 844. The work consists in the synthesis of aromatic compounds. Chemistry 844 and 845 lead directly to minor research problems in organic chemistry.

850. Seminary in Organic Chemistry. Three credit hours. Autumn Quarter. Three conference hours each week. Prerequisites, Chemistry 841, 842. Mr. Boord.

The course consists of conferences and reports upon some chosen topic in the field of organic chemistry. Topic for 1924-1925: Synthetic Organic Medicinals.

851. Seminary in Organic Chemistry. Three credit hours. Winter Quarter. Three conference hours each week. Prerequisites, Chemistry 841-842. Mr. Evans.

The course consists of conferences and reports upon some chosen topic in the field of organic chemistry. Topic for 1924-1925: Selected chapters in organic nitrogen derivatives (First group).

852. Seminary in Organic Chemistry. Three credit hours. Spring Quarter. Three conference hours each week. Prerequisites, Chemistry 841-842. Mr. McPherson.

The course consists of conferences and reports upon some chosen topic in the field of organic chemistry. Topic for 1924-1925: Stereo-isomerism.

861. Physical Chemistry: Laboratory. Three credit hours. Autumn Quarter. Nine laboratory hours each week. Prerequisites, satisfactory courses in physical chemistry including elementary laboratory work. Mr. Mack or Mr. France, and assistants.

This is the fundamental course in physical chemistry experimental work designed to illustrate the most important principles of physical chemistry, to develop skill in this type of laboratory work and to form a basis for research work in this branch of chemistry.

This course is not open to students who have credit for Chemistry 201.

862-863. Physical Chemistry: Laboratory. Three credit hours. Winter and Spring Quarters. Nine laboratory hours each week. Prerequisites, satisfactory courses in physical chemistry including elementary laboratory work. Mr. Mack, Mr. France, and assistants.

This is a continuation of Chemistry 861. The three courses—861, 862, and 863 constitute one continuous course.

This course is not open to students who have credit for Chemistry 202.

865. Atomic Structure. Two credit hours. Spring Quarter. Two lectures or conferences each week. Prerequisite, a satisfactory course in physical chemistry. Mr. Henderson.

This course will be devoted to a study of the modern theories involving the structure of the atom.

866. Seminary in Inorganic Chemistry. Two credit hours. Winter Quarter. Two conferences each week. Prerequisite, a satisfactory course in physical chemistry. Mr. Day.

Topic for 1924-1925: Recent Advances in Inorganic Chemistry.

891. Seminary in Physical Chemistry. Three credit hours. Autumn Quarter. Three conferences each week. Prerequisite, a satisfactory course in physical chemistry. Mr. France.

Subject for 1924-1925: Adsorption.

892. Seminary in Physical Chemistry. Two credit hours. Winter Quarter. Two conferences each week. Prerequisite, a satisfactory course in physical chemistry. Mr. Mack.

This course consists in a discussion of the subject: Catalysis.

900-901-902. Advanced Industrial Chemistry. Two to five credit hours. Autumn, Winter, Spring Quarters. One hour conference and five to fourteen laboratory hours each week. Prerequisites, acceptable courses in industrial chemistry. Mr. Withrow.

An advanced course dealing with the solution of minor problems in industrial chemistry and in chemical engineering. Special work will be planned along lines in industrial chemistry as may be desired by the individual student.

This course is not open to students who have credit for Chemistry 241-242.

905-906-907. Seminary in Industrial Chemistry. Two credit hours. Autumn, Winter, Spring Quarters. Two conference hours each week. Prerequisites, satisfactory courses in industrial chemistry. Mr. Withrow.

The course consists of conferences and reports upon methods of attacking special problems in industrial chemistry and chemical engineering. The topics vary from Quarter to Quarter, keeping in touch with the constant development of chemical industry.

930. Historical Chemistry. Three credit hours. Winter Quarter. Three lectures each week. Prerequisites, satisfactory courses in organic and physical chemistry. Mr. Henderson.

A general course in the history of chemistry with special reference to the development of the theories of the science.

This course is not open to students who have credit for Chemistry 213.

950. Chemical Research. Five to fifteen credit hours. Autumn, Winter, Spring Quarters. Library, conference and laboratory work. Prerequisites, satisfactory courses in the chosen field of research.

Research work in organic chemistry is conducted under the supervision of Mr. McPherson, Mr. Evans, Mr. Boord, and Mr. Looker; in inorganic chemistry under Mr. Henderson, Mr. France, and Mr. Day; in physical chemistry under Mr. France and Mr. Mack; in analytical chemistry under Mr. Foulk and Mr. Hollingsworth; in industrial and applied electrochemistry and in chemical engineering under Mr. Withrow and Mr. Fritz.

Chemical Colloquium. No specific credit is given for this course, but all graduate students in chemistry are expected to attend it. The Colloquium is an organization of all the members of the instructional force of the University who are directly interested in pure or applied chemistry. Meetings are held bi-weekly and are devoted to discussions of important topics included in the field of chemistry. While the members of the instructional force naturally lead in these discussions, nevertheless, the graduate students may be called upon to report upon certain phases of the topic under discussion.

CIVIL ENGINEERING

Office, 108 Brown Hall

PROFESSOR ENO

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Prerequisites are waived for graduate students majoring in the curriculum in Public Health.

602. Sanitary Engineering. Five credit hours. Autumn Quarter. Five recitations each week. Open to students who are majoring in the curriculum in Public Health. Mr. Eno.

Lectures and recitations upon sewerage systems; sewage; and sewage treatment.

This course is not open to students who have credit for Civil Engineering 109.

703. Water Supply Engineering. Four credit hours. Winter Quarter. Five recitations each week. Open to students who are majoring in the curriculum in Public Health. Mr. Eno.

Construction and operation of public water supplies.

This course is not open to students who have credit for Civil Engineering 117.

COMPARATIVE LITERATURE AND LANGUAGE

Courses formerly offered under the above heading will be found under the Departments of German, Greek, and Latin.

DAIRYING

Office, 111 Townshend Hall

PROFESSORS ERF AND STOLTZ

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in dairying and the consent of the instructor. Course 602 requires also a fundamental course in animal husbandry.

602. Dairy Inspection Trip. Three credit hours. Spring Quarter. Mr. Erf.

This course consists of a two-weeks' inspection trip to the best dairies of the State. The methods of feeding, lines of breeding, herd management, dairy barn construction and planning, and manner of disposing of the product as found on these farms will be discussed by the instructor. The trip will be made in machines and camping equipment will be carried. A complete report of the trip must be made. A deposit of \$50 to cover the expense of the trip is required.

603. Dairy Herd Management. Three or five credit hours. One Quarter. Autumn, Winter, Spring. May be scheduled only by men doing cow testing association work. Mr. Erf.

The work of the course includes visiting not less than twenty herds for at least eight consecutive months. During these visits the milk of each cow is weighed and tested for fat and total solids, feeds are weighed and costs calculated, economical feeds selected, labor costs calculated and other items of expense determined, in order to ascertain whether each cow is kept at a profit or loss. Suggestions for methods of increasing profits and improving sanitary conditions must be incorporated in a monthly report.

This course is not open to students who have credit for Dairying 121.

604. Special Problems in Dairy Manufacturing Practice. Two to five credit hours. Autumn, Winter, Spring. One hour conference each week. Mr. Stoltz.

This course is designed for students majoring in dairy manufacturing and consists in working out special problems along the lines in which they are specializing.

This course is not open to students who have credit for Dairying 125.

FOR GRADUATES

Prerequisite for Graduate Work: Major work in this department should embrace as general prerequisites, the courses pertaining to the fundamental principles of dairying—namely, the care of dairy cows; formation of profitable herds; equipment of dairy houses, barns, milk plants, and refrigerating plants; the testing of milk, cream, butter, and cheese; the care of milk and cream; butter making, cheese making, and ice cream making.

801. Advanced Dairying. Five to ten credit hours. Autumn, Winter, Spring Quarters. One hour conference each week. Prerequisite, at least twenty hours of work in the department and the consent of the instructor. Mr. Erf, Mr. Stoltz.

Special work will be arranged for students desiring to take up any particular phase of dairying. Any apparatus on hand will be furnished and room will be arranged for students desiring to take up any line, such as farm dairying, the feeding and breeding of dairy cows in relation to milk production, the study of milk in its various phases, butter making, cheese making, ice cream making, and milk condensing.

DRAWING

(See Engineering Drawing)

ECONOMIC AND SOCIAL GEOGRAPHY

Office, Commerce Building

PROFESSOR HUNTINGTON, ASSISTANT PROFESSORS VAN CLEEF
AND CARLSON

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in economic and social geography and economics in addition to any prerequisites stated in the description of the courses.

601. Historical Geography and Commerce of the United States. Three credit hours. One Quarter. Winter and Spring. Three recitations each week. Mr. Huntington.

Geographic influences in the historic development of the United States. Location, topography, climate, and natural resources as factors in the distribution of population, the selection of occupations and the location of industries and trade routes. The development of the internal commerce of the United States, and the basis of her foreign trade.

This course is not open to students who have credit for Economics 184.

603. The Localization of Manufacturing Industries of the United States. Four credit hours. Spring Quarter. Four recitations each week. Mr. Carlson.

Geographic influences on American manufacturing. The distribution of the industry in the United States. The relation of land and population to the growth and variety of manufacturers. Factors affecting the localization of particular industries. The development of centers of general industry. Industrial districts. Classification and analysis of the manufacturing business of the United States as a whole, and special study of representative industries, as to labor, supply, sources, quantity, and value of material and power used, transportation facilities available, quantity and value of products, and problems of competition and markets. A term report will be required of each student.

604. Conservation of Natural Resources. Two credit hours. Autumn Quarter. Two recitations each week. Mr. Huntington.

The importance of the fundamental natural resources: agricultural, forest, mineral, and water. The exploitation of soils, forests, mines, etc., and the movement for their conservation. The reclamation of arid and swamp land, reduction of erosion, development of forestry, elimination of waste in mining, improvement of waterways, use of water power, and problems of water supply.

This course is not open to students who have credit for Economics 104.

605. Economic and Social Geography of Ohio. Two credit hours. Winter Quarter. Two recitations each week. Mr. Huntington.

Geographic influences in the history of the state. A study of its agriculture, industries, and social conditions, together with the underlying physical, climatic, and other environmental factors that have contributed to the present development of the region.

This course is not open to students who have credit for Economics 121.

606. Land Utilization. Two credit hours. Spring Quarter. Mr. Huntington.

Land as a natural resource. Its importance and classification. A discussion of agricultural, forest, mineral, and urban lands. Character and location as factors in utilization and value. The relation of classification to land policies and conservation policies.

621. Economic and Social Geography of Europe. Three credit hours. Autumn Quarter. Three recitations each week. Mr. Huntington.

A study of the human geography of Europe. The racial geography of the continent and the influences of geographic environment in the economic, social, and political progress of the various nations.

This course is not open to students who have credit for Economics 122.

623. The Political Geography of South America. Three credit hours. Autumn Quarter. Three recitations each week. Mr. Carlson.

A regional study of South America. Location, topography, climate, and natural resources, influencing economic, social, and political development. The commercial relations of South America, with particular reference to the United States.

This course is not open to students who have credit for Economics 103.

624. The Caribbean Region and the Panama Canal. Three credit hours. Winter Quarter. Three recitations each week. Mr. Carlson.

The geography of the regions between the United States and South America. Their resources, industries, and products. The economic and social development of their people and the nature and relations of their trade, particularly with the United States. The commercial and strategic importance of the Panama Canal to both the Americas.

This course is not open to students who have credit for Economics 103.

625. The Economic Geography of the Far East. Three credit hours. Spring Quarter. Three recitations each week. Mr. Van Cleef.

The geographical aspects of the economic and political problems of the Pacific and Indian Oceans. The ratio of land to population in the islands and lands adjacent to these oceans and the resultant economic, social, and political consequences. Their undeveloped resources and the opportunity for the investment of American capital. The present and prospective commercial relations of the United States with Asia, Africa, and Australasia.

631. The Geography and History of Commerce. Three credit hours. Spring Quarter. Three recitations each week. Mr. Van Cleef.

A study of the basis and development of commerce from earliest times to the present. The successive leadership among the nations and the contributing factors. Geographic influences in present-day national commercial policies and in modern business.

This course is not open to students who have credit for Economics 159.

633. World Industries and Commerce. Three credit hours. Autumn Quarter. Three recitations each week. Mr. Van Cleef.

A survey of the world's important industries and the geographic factors influencing their location and development. The great staple products, the exchange of commodities, the direction of movement, and the balance of trade. The relation of trade balances to industrial development. The possible world's markets for the American merchant.

This course is not open to students who have credit for Economics 123.

634. Trade Centers and Trade Routes. Three credit hours. Winter Quarter. Three recitations each week. Mr. Van Cleef.

The world's principal ports, inland trade centers, and trade routes are considered in the light of both domestic and foreign trade development. A study of geographic factors in the establishment and growth of trade centers. The reciprocal relations in the development of the hinterland and trade centers.

The world's great trade routes, including land as well as water routes and their effect upon the shifting of trade centers. The significance of inland waterways in trade. The work of a port. Planning for its future.

The part played by postal, telegraph, and cable communication in the world's trade. Coaling stations, their location, strategic and economic importance.

641. Field Work in Geography and Commerce. One to three credit hours. One Quarter. Autumn and Spring. Prerequisite, Economic Geography 601 or 631, or consent of instructor. Mr. Huntington, Mr. Van Cleef.

Special investigations in the field of applied geography. Each student will be required to write up the results of his work in the form of maps, diagrams, and a final typewritten report. Assigned readings, conferences, and reports.

FOR GRADUATES

801-802-803. Research in Geography and Commerce. One to three credit hours. Autumn, Winter, Spring Quarters. Prerequisite, at least two years' work in geography, one year's work in economics, and consent of the instructor. Mr. Huntington, Mr. Van Cleef.

Assigned problems for investigation and reports under the direction of the instructor.

805-806-807. Seminary in Geography and Commerce. Two credit hours. Autumn, Winter, Spring Quarters. All instructors.

ECONOMICS

Office, Commerce Building

PROFESSORS HAMMOND, HAYES, WOLFE, RUGGLES, HOAGLAND, AND MARK,
ASSISTANT PROFESSORS WALRADT, HELD, DICE, AND FITZGERALD,
MR. CROXTON, MR. SMART, MR. WILLIT, MR. FINK

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in economics in addition to any prerequisites stated in the description of the courses. For 643 and 644 a fundamental course in sociology may be offered in place of economics.

601-602-603. Principles and Problems of Economics. Three credit hours. Autumn, Winter, Spring Quarters. Open to graduate students who are not taking economics as a major. Mr. Wolfe.

A general course covering the entire field of economics intended for those students who plan to do only one year's work in economics or who have not had time or opportunity to do work in this field prior to their fourth year. The scope of the work is the same as in Economics 401-402, but the lectures, readings, and recitations will be suited to the needs of maturer students.

This course is not open to students who have credit for Economics 401-402 or 135-136 or 101-102.

607-608. Financial History of the United States. Three credit hours. Autumn and Winter Quarters. Mr. Walradt.

A study of the fiscal and monetary history of the country from colonial times to the present, with special reference to federal taxation, loans, and financial administration, currency, legislation, and the development of banking institutions.

This course is not open to students who have credit for Economics 147-148.

610. Money and Banking. Five credit hours. One Quarter. Autumn, Winter, Spring. Five recitations each week. Mr. Dice, instructors, and assistants.

This course is a general survey of the field of money and banking. It is intended as an introductory study to the more technical courses in banking and finance and also to give a comprehensive view of the field of money and banking for those not primarily interested in the subjects.

Topics taken up are: coinage; the monetary systems of the United States and foreign countries; the gold exchange standard; credit; price levels; the development of banking; the commercial bank; the savings bank; the trust company; the National Banking system; the Federal Reserve system; the interrelations of our financial institutions; and the relation of the financial structure to the business and industrial system.

This course is not open to students who have credit for Economics 153.

616. Corporation Economics. Five credit hours. Autumn Quarter. Two lectures and three quiz periods each week. Mr. Fink.

This course is designed especially to meet the needs of students outside of the College of Commerce and Journalism who desire an introduction to the forms of business organization and to the financial problems of corporations. Attention will be given also to public regulation and control of corporations.

This course is not open to students who have credit for or who are taking Business Organization 650 or who have credit for Economics 163.

617. Trusts and Monopolies. Three credit hours. Winter Quarter. Three recitations each week. Prerequisites, Economics 616 or Business Organization 640 and 650. Mr. Hoagland.

Business combinations with monopolistic tendencies; case study, historical and analytical, of typical trusts; their influence upon production, prices, profits, wages, and public welfare; early legislation against trusts; leading cases under Sherman law; dissolution proceedings and results; development of judicial interpretation of this law; foreign experience in legislation; success of early trusts; recent tendencies in legislation and in business combinations.

This course is not open to students who have credit for Economics 183.

618. Transportation Economics. Five credit hours. One Quarter. Autumn, Winter, Spring. Five lecture and quiz periods each week. Mr. Ruggles.

The development of the means of transportation including canals, highways, and railways. Railway growth and consolidation of railways, rate theories and practice. Analysis of state and federal legislation affecting transportation. Administrative control of carriers. Government ownership of railroads.

This course is not open to students who have credit for Economics 167.

622. Economic Statistics. Three credit hours. One Quarter. Autumn, Winter, Spring. Two lectures and one two-hour laboratory period each week. Mr. Smart and assistant.

A general course in statistical methods dealing with the making of schedules and table forms; sampling; the calculations of averages, ratios, and percentages; the computation of labor turnover and the construction of index numbers and graphic charts. Attention will be given to sources of secondary data; a field problem illustrating the methods of a primary statistical study will be developed by the class.

This course is not open to students who have credit for Economics 177.

624. Principles of Insurance. Three credit hours. Autumn Quarter. Three lecture and discussion periods each week. Mr. Fitzgerald.

Risk; uses of insurance; kinds of insuring organizations; agency organization; underwriters' associations. Life insurance: kinds of policies and their uses; premiums; expenses; reserves; surrender values and loans; surplus and dividends; policy clauses; special forms of life insurance. Accident and health insurance. Fire insurance: insurable interest; protection of creditors; provisions of the standard policy and the principal standard indorsements; rate-making; reserves; settlement of losses. Marine, automobile, title and credit insurance; corporate bonding. State supervision.

This course is not open to students who have credit for Economics 157 or Business Organization 760.

631. Public Finance. Three credit hours. One Quarter. Autumn and Spring. Mr. Walradt.

A study of the problems connected with the debts, expenditures, revenues, and fiscal administration of national, state, and municipal governments.

This course is not open to students who have credit for Economics 141.

632. Public Finance. Three credit hours. One Quarter. Autumn and Winter. Prerequisite, Economics 631. Mr. Walradt.

This is a continuation of Economics 631.

This course is not open to students who have credit for Economics 144.

633. Public Finance. Three credit hours. One Quarter. Winter and Spring. Prerequisite, Economics 632. Mr. Walradt.

This is a continuation of Economics 632.

This course is not open to students who have credit for Economics 144.

637. Industrial Relations. Three credit hours. Autumn Quarter. Mr. Hammond.

The labor movement. Trade unions and employers' associations; their origin, growth, policies, and methods. Industrial disputes and modes of settling them: mediation, conciliation, and arbitration. Government intervention and its success at home and abroad. The recent movement to secure for labor a participation in the management of industry and to increase the interest of labor in the work of production.

This course is not open to students who have credit for Economics 166.

638. Labor Legislation. Three credit hours. Winter Quarter. Mr. Hammond.

Efforts on the part of government to improve the condition of the laboring class and to increase the bargaining power of labor. The theory of the legal regulation of labor; legislation and court decisions. Child labor and its legal prohibition or restriction. The legal regulation of the employment of women in industry. The problem of low-paid labor and the legal minimum wage. The working day and the legal regulation of hours of labor. Efforts to secure by law safe and sanitary conditions for workers in factories, tenements, mines, and in transportation. The administration of labor laws.

This course is not open to students who have credit for Economics 165.

639. Social Insurance. Three credit hours. Spring Quarter. Pre-requisite, Economics 638 or 624. Mr. Hammond.

Recent efforts at home and abroad to guarantee to the worker financial security against the hazards of industry. Accident insurance; employers' liability and workmen's compensation. Industrial health hazards and health insurance. Old age and invalidity insurance or pensions. The problem of unemployment and its prevention. Employment agencies, private and public. The regularization of employment; unemployment insurance.

643. Women in Industry. Four credit hours. Autumn Quarter. Four recitations each week. Miss Mark.

A study of the economic position of women. Social, industrial, and legislative problems created by their entrance into the field of industry. A survey of the occupations open to trained women.

This course is not open to students who have credit for Economics 119.

644. The Household. Four credit hours. Winter Quarter. Four recitations each week. Miss Mark.

The family as an economic institution. Organization of the household with reference to the functions of the various members. The standard of living, family budgets, retail buying.

This course is not open to students who have credit for Economics 120.

648. Economics of Public Service Industries. Five credit hours. One Quarter. Autumn and Spring. Three lecture and quiz periods each week. Mr. Ruggles.

A study of the following utilities: water; sewage; gas; electric light and power; central heating; refrigeration; telephone; telegraph; pneumatic tube; surface, elevated, and subway railways; auto bus; and interurban transportation. Attention is given to the method of granting franchises; essential features of franchises for the various utilities; inter-utility relationships with special reference to mergers and consolidations and their effect upon service; local, state, and interstate utility legislation; legislative, judicial, and administrative control; services to cities, states, and to private consumers with special reference to peak load problems and discrimination in service; maximum and minimum rates and the relationship of rates to capitalization and taxation of utilities. Public ownership in Europe and United States.

This course is not open to students who have credit for Economics 105.

651. International Commercial Policies. Three credit hours. Spring Quarter. Mr. Held.

The theory of international trade; historic policies; mercantilism; free trade and protection. A study of the tariff policy of the United States with a comparative study of the policies of other countries. International trade as affected by the World War.

This course is not open to students who have credit for Economics 160.

655. Prices and the Economic Cycle. Two credit hours. Autumn Quarter. Preferably preceded or accompanied by Economics 610. Mr. Wolfe.

The price system. The purchasing power of money. Price levels and their measurement. The economic cycle. The problem of stabilization of prices.

656. Wages and Profits. Three credit hours. Winter Quarter. Mr. Hayes.

The national economic income; its size and division among the different groups of income receivers. The principles governing this division. Proposals to alter the divisions of income by taxation and other methods.

657. Socialism. Three credit hours. Spring Quarter. Mr. Hayes.

A critique of the present economic system and of the leading plans proposed as substitutes for it, including state socialism, syndicalism, and guild socialism, with a view to determining their relative merits and defects. Special attention is given to the revolutionary movements abroad.

This course is not open to students who have credit for Economics 124.

658-659. Economic Problems of Population. Two credit hours. Winter and Spring Quarters. Mr. Wolfe.

A critical survey of the population problem in its broader economic aspects. Population theories. Factors determining the growth of population. Population in relation to productive capacity, standards of living, distribution of income, commercial rivalry, and war. Population policies historically and critically considered.

661-662-663. Economic History of the United States. Three credit hours. Autumn, Winter, Spring Quarters. Mr. Smart.

The development of agriculture, trade, transportation, and manufactures from the comparatively simple system of colonial days to the complex economic organization of the present. The course endeavors to point out the interrelation which exists between this development and such problems as the tariff, merchant marine, commercial crises, labor, currency, and banking conditions.

This course is not open to students who have credit for Economics 181-182.

FOR GRADUATES

Prerequisite for Graduate Work: A minimum of fifteen Quarter-credit hours and the consent of the instructor.

801-802-803. History of Economic Thought. Three credit hours. Autumn, Winter, Spring Quarters. Mr. Hammond.

An account of the development of economic ideas and principles in the Western World with the purpose of showing how they were the outgrowth of the economic and political conditions of the times in which they originated and the extent to which they have found acceptance by present-day economists. The works of the leading writers in each period are read and discussed in class.

810-811. Principles of Economics for College Teachers. Two credit hours. Autumn and Winter Quarters. Mr. Hayes.

An advanced study of the principles of economics for graduate assistants and instructors in Economics 401-402. Other graduate students may be admitted with consent of instructor.

816-817-818. Modern Economic Theories. Three credit hours. Autumn, Winter, Spring Quarters. Mr. Wolfe.

A course designed to acquaint the student with the contributions to theory of the chief economic writers of the last half-century and to examine analytically and critically modern theories of value and distribution.

819-820-821. French and German Economics. Two credit hours. Autumn, Winter, Spring Quarters. Open to graduate students who have had not less than one year's training in French and the same amount in German. Mr. Held.

A study of selected works of French and German economists of the last half-century. Students who expect to take the examination for the Doctor's degree will find this course a valuable aid in acquiring a reading knowledge of French and German.

822-823-824. Seminary in Economics and Statistics. Two credit hours. Autumn, Winter, Spring Quarters. All instructors.

Graduate students and the instructors in the department will meet regularly for the presentation of the results of investigation, the review of current economic literature, and the discussion of current problems.

828-829-830. Research in Labor Problems and Legislation. One to three credit hours. Autumn, Winter, Spring Quarters. Mr. Hammond.

Graduate students especially interested in these problems will make their investigations under direction of the instructor.

831-832-833. Railroad Rates and Rate Control. One to three credit hours. Autumn, Winter, Spring Quarters. Mr. Ruggles.

A study of the theory of railroad rates in the United States and in European countries. Special emphasis is placed on railroad rates and rate control in the United States since 1906.

835-836-837. Theories of Public Utility Rates in Europe and the United States. One to three credit hours. Autumn, Winter, Spring Quarters. Mr. Ruggles.

A study of the various theories of utility rate making in the leading European countries and the United States.

839-840-841. Research in Corporation Economics and Trust Problems. One to three credit hours. Autumn, Winter, Spring Quarters. Prerequisite, the permission of the instructor. Mr. Hoagland.

Individual investigations with group discussions participated in by those investigating related subjects.

845-846-847. Research in Money and Banking. One to three credit hours. Autumn, Winter, Spring Quarters. Mr. Dice.

The work under this head will consist of study made of special problems in the field of money and banking. Each student in conference with the instructor in charge will choose some problem along his line of interest. Large emphasis will be placed on field work. It is expected that each student will make a more or less prolonged study of his problem, from time to time present the material he has gathered in the form of reports, and write a paper which shall represent the work complete.

851-852-853. Research in Public Finance. One to three credit hours. Autumn, Winter, Spring Quarters. Prerequisite, the permission of the instructor. Mr. Walradt.

A course intended for graduate students who have a desire to do special work along this line.

854-855-856. Research in Theories and Problems of International Trade. One to three credit hours. Autumn, Winter, Spring Quarters. Prerequisite, the permission of the instructor. Mr. Held.

Students writing theses or specializing in this field may carry on their investigations under the direction of the instructor.

857-858-859. Research in Economic Theory. One to three credit hours. Autumn, Winter, Spring Quarters. Prerequisite, the permission of the instructor. Mr. Wolfe.

Students interested in advanced theoretical work may write their dissertations in connection with this course.

ELECTRICAL ENGINEERING

Office, 171 Robinson Laboratory

PROFESSORS CALDWELL AND WRIGHT, ASSISTANT PROFESSORS
R. A. BROWN, PUCHSTEIN, AND SHEPARDSON

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in mathematics and physics, and the permission of the instructor, in addition to any prerequisites stated in the description of the courses.

601. Direct Current Equipment. Five credit hours. One Quarter. Autumn and Winter. Three class hours and three laboratory hours each week. Prerequisite, Mechanics 601. Mr. Wright.

Generators and motors; a study of their theory, construction, and operation.

This course is not open to students who have credit for Electrical Engineering 104.

605. Alternating Current Circuits and Equipment. Five credit hours. One Quarter. Autumn and Winter. Three class hours and three laboratory hours each week. Prerequisite, Mechanics 601. Mr. Caldwell, Mr. Shepardson.

Inductance, capacity, reactance, impedance, series and parallel circuits, power, power factor, polyphase systems. General survey of alternators, transformers, and motors.

This course is not open to students who have credit for Electrical Engineering 108.

610. Medium Frequency Currents. Two credit hours. Spring Quarter. Two class hours each week, one three-hour laboratory period every other week. Prerequisites, Electrical Engineering 601 and 605; concurrent, Electrical Engineering 615. Mr. Wright.

An elementary treatment of communication circuits and apparatus using audio-frequencies, including a study of telephone transmitters, receivers and systems and the methods of extending the range and use of telephone lines.

This course is not open to students who have credit for Electrical Engineering 115.

615. High Frequency Currents. Two credit hours. Spring Quarter. Two class hours each week, one three-hour laboratory period every other week. Prerequisites, Electrical Engineering 601 and 605; concurrent, Electrical Engineering 610. Mr. Brown.

An elementary study of radio frequency circuits and equipment, including vacuum tubes, radio telegraph and telephone transmitting and receiving systems, detectors and amplifiers.

This course is not open to students who have credit for Electrical Engineering 119.

620. Applications, Control, and Problems. Three credit hours. Spring Quarter. Three class hours and three calculation hours each week. Prerequisites, Electrical Engineering 601 and 605. Mr. Caldwell and others.

A brief treatment of the uses of electricity in illumination, railways, manufacturing, mining, control, etc.

This course is not open to students who have credit for Electrical Engineering 106.

630. Electrical Engineering. Five credit hours. Winter Quarter. Three class hours and four laboratory hours each week.

Electrical circuits, machinery, and transmission, with particular reference to the operation of electrical machinery.

This course is not open to students who have credit for Electrical Engineering 103.

635. Electrical Equipment. Three credit hours. Spring Quarter. Two class hours and two problem hours each week. Prerequisite, Electrical Engineering 630. Mr. Wright.

The layout and cost of electrical equipment.

This course is not open to students who have credit for Electrical Engineering 142.

640. Electrical Engineering. Two credit hours. Winter Quarter. Two class hours each week.

The elementary theory of direct and alternating current circuits, generators, motors, and other equipment.

This course is not open to students who have credit for Electrical Engineering 101.

641. Electrical Engineering. Five credit hours. Spring Quarter. Two class hours and two three-hour laboratory periods each week. Prerequisite, Electrical Engineering 640. Mr. Shepardson.

Theory, operating characteristics, and applications of direct and alternating current generators, motors, and other equipment.

This course is not open to students who have credit for Electrical Engineering 101.

701-702. Alternating Current Equipment. Three credit hours. Autumn and Winter Quarters. Three class hours and three calculation hours each week. Prerequisites, Electrical Engineering 601 and 605; concurrent, Electrical Engineering 705-706. Mr. Caldwell, Mr. Puchstein.

Advanced treatment of transformers, alternators, converters, rectifiers, motors, and other equipment.

This course is not open to students who have credit for Electrical Engineering 109.

705-706. Alternating Current Laboratory. Four credit hours. Autumn and Winter Quarters. Five laboratory hours each week. Concurrent, Electrical Engineering 701-702. Mr. Brown.

Testing of alternating current apparatus and storage batteries.

This course is not open to students who have credit for Electrical Engineering 111-112.

710. Electrical Railways. Four credit hours. Autumn Quarter. Three class hours and three problem hours each week. Prerequisite, Electrical Engineering 601. Mr. Shepardson.

A study of railway operation and the application of electric motors to train propulsion. Traffic studies, electric motor characteristics, and control system. Speed-time and other performance curves. Power distribution. Electric traction systems. Locomotive train haulage and the application of electric traction to trunk line railways.

This course is not open to students who have credit for Electrical Engineering 113.

715. Wire Telephony and Telegraphy. Four credit hours. Autumn Quarter. Three class hours and three laboratory hours each week. Prerequisite, Electrical Engineering 610. Mr. Wright.

Advanced study of manual and automatic circuits and equipment, telephone maintenance and testing, inductive interference, fundamental plans and telephone economics.

This course is not open to students who have credit for Electrical Engineering 115.

720. Electrical Illumination. Four credit hours. Autumn Quarter. Three class hours and three laboratory hours each week. Mr. Caldwell.

Modern lighting, industrial, commercial, auditorium, residence, street, etc. Light sources and accessories, reflection, absorption, transmission, glare, diffusion, color, etc.

This course is not open to students who have credit for Electrical Engineering 117.

722. Electrical Illumination. Three credit hours. Autumn Quarter. Three class hours each week. This course coincides with the class work of Electrical Engineering 720. Mr. Caldwell.

Modern lighting, industrial, commercial, auditorium, residence, street, etc. Light sources and accessories, reflection, absorption, transmission, glare, diffusion, color, etc.

This course is not open to students who have credit for Electrical Engineering 117.

725. Radio Telegraphy and Telephony. Four credit hours. Autumn Quarter. Three class hours and three laboratory hours each week. Prerequisite, Electrical Engineering 615. Mr. Brown.

Production, transmission, detection and amplification of damped and undamped oscillations as applied to radio telegraphy and telephony, theory and application.

This course is not open to students who have credit for Electrical Engineering 119.

730. Electrical Design. Four credit hours. Winter Quarter. Three three-hour calculation periods each week. Prerequisites, Electrical Engineering 701, 601 and 605. Mr. Puchstein.

Design procedure and theory of magnets, direct current dynamos, transformers, etc.

This course is not open to students who have credit for Electrical Engineering 121.

731. Advanced Electrical Design. Three credit hours. Spring Quarter. Two three-hour calculation periods each week. Mr. Puchstein.

This is a continuation of Electrical Engineering 730.

Design procedure and design theory of alternating current apparatus, synchronous, asynchronous, commutator, and transforming.

This course is not open to students who have credit for Electrical Engineering 122.

735-736. Thesis. Three credit hours, 735, any Quarter. Five credit hours, 736, any Quarter. Prerequisites, Electrical Engineering 601 and 605. All instructors.

740. Electrical Transmission and Distribution. Three credit hours. Spring Quarter. Three class hours each week. Prerequisite, Electrical Engineering 702, or 775 and 776. Mr. Caldwell, Mr. Puchstein.

The theory and economics of transmission and distribution systems and apparatus and their organization and operation.

This course is not open to students who have credit for Electrical Engineering 124.

745. Advanced Electrical Engineering Laboratory. Four credit hours. Spring Quarter. Five laboratory hours each week. Prerequisites, Electrical Engineering 702, 706. Mr. Brown and others.

Advanced testing of alternating current and other equipment.

This course is not open to students who have credit for Electrical Engineering 112.

760-761-762. Special Advanced Reading. Credit hours to be arranged. Three Quarters. All instructors.

765-766-767. Special Advanced Laboratory. Credit hours to be arranged. Three Quarters. All instructors.

Selected tests on illumination, railway, telephone, radio, and other electrical equipment.

770. The Application of Hyperbolic Functions to Electrical Engineering Problems. Three credit hours. Spring Quarter. Two three-hour calculation periods each week. Prerequisite, Electrical Engineering 702; concurrent, Electrical Engineering 740. Mr. Puchstein.

Operations with plane vector and hyperbolic quantities and their application to powerlines, artificial lines, communication, railway signalling, current distribution in armature conductors, etc.

This course is not open to students who have credit for Electrical Engineering 140.

775. Electrical Engineering. Four credit hours. One Quarter. Autumn and Winter. Two class hours and four laboratory hours each week. Mr. Puchstein.

Characteristics and principles of operation of direct current generators, motors, control systems, and storage batteries.

This course is not open to students who have credit for Electrical Engineering 101 or 601.

776. Electrical Engineering. Four credit hours. One Quarter. Autumn and Winter. Two class hours and four laboratory hours each week. Mr. Shepardson.

Alternating current circuits and the characteristics, operation, and applications of alternating current generators, motors, transformers, and other equipment.

This course is not open to students who have credit for Electrical Engineering 101 or 605.

FOR GRADUATES

Prerequisite for Graduate Work: Graduate work in electrical engineering presupposes the requisite foundation courses in mathematics, physics, and electrical measurements.

For major work a candidate must hold a baccalaureate degree in Electrical Engineering.

Graduate work will be given to individual students and groups under the course numbers given below. This work will be in charge of the instructors as here indicated. Mr. Caldwell, alternating current theory and equipment illumination. Mr. Wright, wave forms, transient phenomena, telephone, telegraph. Mr. Brown, alternating current equipment, radio, high frequency currents. Mr. Fuchstein, electrical machine design, transmission. Mr. Shepardson, electric traction.

801-802-803. Advanced Theoretical Study of Electrical Engineering Practice and Equipment. Credit hours to be arranged.

805-806-807. Advanced Laboratory Study of Electrical Engineering Equipment. Credit hours to be arranged.

811-812-813. Research Work. Credit hours to be arranged.

ENGINEERING DRAWING

Office, 205 Brown Hall

PROFESSORS FRENCH AND SVENSEN

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in engineering drawing, and the permission of the instructor, in addition to any prerequisites stated in the description of the courses.

701. Chemical Machine Drawing. Two credit hours. Autumn Quarter. Six laboratory hours each week. Mr. Svensen.

The drawing and design of machinery and apparatus as related to industrial chemistry.

This course is not open to students who have credit for Engineering Drawing 121.

702. Chemical Plant Layout. Two credit hours. Winter Quarter. Six laboratory hours each week. Prerequisite, Engineering Drawing 701. Mr. Svensen.

The sketching, drawing, and preliminary layout of industrial chemical plants.

This course is not open to students who have credit for Engineering Drawing 122.

703. Chemical Plant Design. Two credit hours. Spring Quarter. Six laboratory hours each week. Prerequisite, Engineering Drawing 702. Mr. Svensen.

The design and drawing of a complete plant for the manufacture of a chemical or related product.

This course is not open to students who have credit for Engineering Drawing 122.

ENGLISH

Office, 103 Physics Building

PROFESSORS DENNEY, TAYLOR, McKNIGHT, GRAVES, KETCHAM, BECK, AND ANDREWS, ASSISTANT PROFESSOR PERCIVAL, MR. MILLER, MR. SMITH

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Courses 636, 651, 657, and 658 require four Quarters in English; 643 and 659 require six Quarters in English; and the remaining courses require five Quarters in English. The preceding requirements are in addition to any prerequisites stated in the description of the courses.

636. Eighteenth Century Poetry and Prose. Five credit hours. Autumn Quarter. Lectures, quiz, readings. Mr. Percival.

A study of the classical, romantic, realistic and sentimental literature of the eighteenth century. Representative prose, poetry, and drama. Especial attention will be given to a study of the life and times of Dr. Samuel Johnson.

This course is not open to students who have credit for English 136-137.

639. The Essay. Five credit hours. Spring Quarter. Lectures, critical study, quiz. Mr. Beck.

The origin and development of the English essay as a literary type.

643. Literature and Composition. Five credit hours. Spring Quarter. Three lectures with conferences on individual work each week. Mr. Andrews.

Recent writers, Kipling, Wilde, Yeats, Symons, James, Galsworthy, Wells, Conrad, Chesterton, Masfeld, and a few others will be read and discussed as a basis for creative and critical writing. Conferences on individual work.

This course is not open to students who have credit for English 143-144.

646. Middle English. Three credit hours. Spring Quarter. Prerequisites, English 651 and 652. Mr. Smith.

Grammar and reading of selected texts.

651. Old English. Three credit hours. Autumn Quarter. Lectures, quiz, readings. Mr. Bloomfield.

Grammar and reading of selected texts.

This course is not open to students who have completed English 151-152.

652. Old English Poetry. Three credit hours. Winter Quarter. Prerequisite, English 651. Mr. Smith.
Beowulf and other assigned texts.

653. Chaucer and His Principal Contemporaries and Successors. Five credit hours. Spring Quarter. Lectures, quiz, readings. Mr. McKnight.

Chaucer's principal works are read. Consideration is also given to Gower, Wycliffe, Langland, the author of Sir Gawayne and the Grene Knight, Occleve, Lydgate, Barbour, James I of Scotland, Dunbar, etc.

This course is not open to students who have credit for English 153.

654. English Mediaeval Literature to Chaucer. Five credit hours. Autumn Quarter. Lectures, quiz, readings. Mr. McKnight.

A study of epic poetry in early English, followed by a study of legends, romances, tales, and metrical histories, all done by means of modern English renderings.

This course is not open to students who have credit for English 154.

655. The Novel: Richardson to Scott. Five credit hours. Winter Quarter. Lectures, quiz, readings. Mr. Taylor.

The history and development of the novel in this period is given by lecture. Reading and criticism of Richardson, Fielding, Sterne, Jane Austen, and Scott.

This course is not open to students who have credit for English 155.

656. The Novel: Dickens to Meredith. Five credit hours. Spring Quarter. Lectures, quiz, readings. Mr. Taylor.

The history and development of the novel in this period is given by lecture. Reading and criticism of Dickens, Thackeray, Trollope, George Eliot, Meredith, Hardy, and James.

This course is not open to students who have credit for English 156.

657. Versification. Five credit hours. Winter Quarter. Lectures, reading, practice. This course is limited to thirty members. Special permission necessary. Mr. Graves.

The theory of verse structure with a history of the principal English rhythms, and practice in verse composition.

This course is not open to students who have credit for English 157.

658. The Short Story. Five credit hours. Autumn Quarter. Lectures, quiz, readings. This course is limited to thirty members. Special permission necessary. Mr. Graves.

Lectures on structure and form in the short story, with class reports on assigned readings, and practice in story writing.

This course is not open to students who have credit for English 158.

659. Milton and Dryden. Five credit hours. Winter Quarter. Lectures, quiz. Mr. Andrews.

Seventeenth century literature with special reference to Milton. The drama of Beaumont and Fletcher and Jonson, the poetry of Milton, Donne, the Cavaliers, the

church poets, and Dryden. The prose of Walton and the character books; Browne, Burton, and Bunyan. The Restoration dramatists.

This course is not open to students who have credit for English 159-160.

667. Shakespeare: Histories and Tragedies. Five credit hours. Autumn Quarter. Two lectures, two quiz hours, one hour written criticism each week. Mr. Denney.

This course is not open to students who have credit for English 167.

668. Shakespeare: Comedies and Romances. Five credit hours. Winter Quarter. Two lectures, two quiz hours, one hour written criticism each week. Mr. Denney.

This course is not open to students who have credit for English 168.

670. Recent and Contemporary Drama. Five credit hours. Autumn Quarter. Five lecture hours each week. Prerequisite, English 667 or 668. Mr. Andrews, Mr. Miller.

One or two plays of each of the leading dramatists since Ibsen will be read, the foreign plays in translation. The authors considered will be Ibsen, Strindberg, Hauptmann, Suderman, Schnitzler, Brieux, Hervieu, Wilde, Pinero, Jones, Barker, Galsworthy, Shaw, Rostand, Maeterlinck, Yeats, Synge.

This course is not open to students who have credit for English 169-170.

672. Shakespeare's Contemporaries and Predecessors in English Drama. Five credit hours. Spring Quarter. Five lecture hours each week. Prerequisite or concurrent, English 667, 668. Mr. Denney.

This course is not open to students who have credit for English 171-172, 221.

681. The Teaching of English. Three credit hours. Autumn Quarter. Mr. Denney, Mr. Beck.

This course is not open to students who have credit for English 181.

FOR GRADUATES

Prerequisite for Graduate Work: For graduate work in this department the student should have a reading knowledge of at least two languages besides English, and not less than twenty semester hours or thirty Quarter-hours in undergraduate English courses. He should also be familiar with the outlines of English and American history.

In awarding fellowships in English, other things being equal, preference will be given to the candidate whose previous training has included courses in Latin, Greek, German, French, English history, American history, psychology, the history of philosophy, esthetics, and at least twenty semester hours or thirty Quarter-hours in English including at least one course in Old and Middle English.

801. History of the Short Narrative in English. Two credit hours. Autumn Quarter. One two-hour session each week. Mr. Graves.

An investigation of types of the short story in English, from the Middle Ages to the present.

This course is not open to students who have credit for English 201.

802. *The Lyric*. Two credit hours. Winter Quarter. One two-hour session each week. Mr. Graves.

A study of the characteristics of lyrical poetry with a history of the lyric in English literature.

This course is not open to students who have credit for English 202.

805. *History of Critical Theory*. Two credit hours. Winter Quarter. One two-hour session each week. Mr. Denney.

Saintsbury's *Loci Critici* is used as the basis of individual investigations.

This course is not open to students who have credit for English 205.

806. *Problems in the Drama*. Two credit hours. Spring Quarter. One two-hour session each week. Mr. Denney.

Each student is assigned a specific problem or period for individual research and weekly report. Topic for 1924-1925: Early Popular Drama.

This course is not open to students who have credit for English 206.

807. *The Later Novel*. Two credit hours. Winter Quarter. One two-hour session each week. Mr. Taylor.

Meredith, Hardy, and James.

This course is not open to students who have credit for English 207.

808. *The Later Poetry*. Two credit hours. Spring Quarter. One two-hour session each week. Mr. Taylor.

Swinburne, Rossetti, Morris, and Meredith, Henley, Kipling.

This course is not open to students who have credit for English 208.

*809. *English and Scottish Popular Ballads*. Three credit hours. Autumn Quarter. One three-hour session each week. Mr. McKnight.

This course is not open to students who have credit for English 209.

810. *English Usage*. Three credit hours. Spring Quarter. One two-hour session each week. Mr. McKnight.

This course is not open to students who have credit for English 210.

811. *Old and Middle English Philology*. Three credit hours. Spring Quarter. One two-hour session each week. Prerequisites, English 651, 652, and 646. Mr. McKnight, Mr. Smith.

813. *The Celtic Renaissance*. Five credit hours. Autumn Quarter. Mr. McKnight.

Subjects for study: The Ossianic literature of the eighteenth century, Lady Guest's translation of the Welsh *Mabinogion* and the English literary works inspired by the translation. The modern revival of ancient Irish story and the related modern literature by Yeats, Lady Gregory, Fiona Macleod, Synge, and others.

This course is not open to students who have credit for English 212.

815. *Studies in Seventeenth Century Literature*. Five credit hours. One Quarter. Autumn and Winter. One two-hour session each week. Mr. Andrews.

* Not given in 1924-1925.

The topic for 1924-1925 will be: Diaries, Memoirs, and Books of Travel.

This course is not open to students who have credit for English 215.

818. Studies in Eighteenth Century Literature. Five credit hours. Autumn Quarter. Two sessions each week. Mr. Percival.

The topic for 1924-1925 will be: Studies in The Mystic Poets.

This course is not open to students who have credit for English 218.

819-820-821. Discussion of Dissertations. Two to five credit hours. Autumn, Winter, Spring Quarters. Individual investigations. Mr. Denney, Mr. Taylor, Mr. Graves, Mr. McKnight, Mr. Andrews, Mr. Percival.

PUBLIC SPEAKING

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in English and public speaking.

625. The Forms of Public Address. Five credit hours. One Quarter. Autumn and Spring. Mr. Ketcham.

A study of the methods of the foremost American and English orators. Class discussions. Practice in the use of different forms of public address. Formal orations; inaugurals; nominating speeches; after-dinner speaking; discussions of current events; political, business, and social addresses.

This course is not open to students who have credit for Public Speaking 125-126 or 525.

651. Special Problems in the Theory of Public Speaking. Five credit hours. Spring Quarter. Mr. Ketcham.

The function of the public speaker in reforms, revolutions, and public movements. Criticism and appreciation. Ideals, aesthetic standards in public speaking. Each student is required to make investigations in some special problem and to bring his results before the class for discussion.

This course is not open to students who have credit for Public Speaking 151-152.

***680. Spoken and Written English: Teachers' Course.** Three credit hours. One Quarter.

Classroom practice designed to assist teachers of composition in secondary schools. Definite suggestions in the following: how to prepare students for debating and speaking contests; the nature of speech training in secondary schools; composition; investigation of subject, recording, organizing, outlining, and writing up the material; delivering of an address, including drill in pronunciation and articulation. Not open to Freshmen. Open only to teachers in secondary schools.

This course is not open to students who have credit for English 180.

ENTOMOLOGY

(See Zoology and Entomology)

* Not given in 1924-1925.

EUROPEAN HISTORY

Office, 305 University Hall

PROFESSORS SIEBERT AND McNEAL, ASSISTANT PROFESSORS WASHBURNE, KNIPFING, AND STUCKERT, MR. NOYES

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in European and American history in addition to any prerequisites stated in the description of the courses.

601. Expansion of Europe to 1588 A. D. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Washburne.

A discussion of the early contact of Europe with other countries, the period of discovery and colonization, the Portuguese empire in the East and the Spanish monopoly in the West. The survey extends to the collapse of the Iberian control of expansion by the destruction of the Armada.

This course is not open to students who have credit for European History 141.

602. Expansion of Europe to 1815. Three credit hours. Winter Quarter. Three lectures each week. Prerequisite, European History 601. Mr. Washburne.

A study of the rise of the chartered trade companies, the ascendancy of the Dutch, the contest between the Dutch and the English for commercial supremacy and the long struggle between the English and the French for commercial and maritime supremacy, with its resultant effects upon India and North America. The survey extends through the settlement at the end of the Napoleonic era.

This course is not open to students who have credit for European History 142.

603. Expansion of Europe from the Beginning of the Nineteenth Century to the Present. Three credit hours. Spring Quarter. Three lectures each week. Prerequisite, European History 602. Mr. Washburne.

A discussion of the problems of expansion in the nineteenth and twentieth centuries; the partition of Africa; the development of India; the movement into the southern Pacific; European interests in the Far East; modern imperialism after 1876 and its relation to the World War, with the resultant readjustment of territory.

604. Constitutional History of England to 1485 A. D. Five credit hours. Autumn Quarter. Four lectures and one quiz each week. Mr. Siebert.

Designed for students who are interested in the origin and development of popular government, for those taking the Arts-Law course or expecting to enter the College of Law, and for graduate students. The work is based in part on a textbook and collateral reading.

This course is not open to students who have credit for European History 113.

605. Constitutional History of England from 1485 A.D. to the Present. Five credit hours. Winter Quarter. Four lectures and one quiz each week. Students who have not previously taken European History 604 will be expected to take it. Mr. Siebert.

Designed for students interested in such phases of English history as parliamentary government, constitutional liberties, the growth of the cabinet and party systems, the rise of democracy. Catholic emancipation, electoral reform, and the Irish question. Intended also for students in the Arts-Law course, for those taking courses in American history or political science and for those expecting to enter the College of Law. The work is based in part on a textbook and collateral reading.

This course is not open to students who have credit for European History 114.

***606. Hellenic Civilization.** Three credit hours. Spring Quarter. Mr. Knipfing.

This course deals with the origin, development, and transmission of Greek culture. Lectures, assigned readings, and discussions.

This course is not open to students who have credit for European History 145-146.

607. Roman Civilization. Three credit hours. Spring Quarter. Mr. Knipfing.

This course deals with the origin, development, and transmission of Roman culture and civilization. Lectures, assigned readings, and discussions.

608. Age of the Renaissance from 1250 to 1527 A.D. Three credit hours. Autumn Quarter. Mr. Siebert, Mr. Knipfing.

This course deals with the rise of our modern civilization, treating of the revolutionary change from the limited religious interest in the Middle Age through the revival of letters to the wide variety of interests in the outward world, manifested in the new painting and architecture, the spread of education, and of printing, the beginnings of modern science, the geographical discoveries, etc. The history of Italy and other countries of western Europe are drawn upon in illustrating these topics. Lectures, collateral reading, and discussions.

This course is not open to students who have credit for European History 109.

609. Period of the Reformation. Three credit hours. Winter Quarter. Three class periods each week. Mr. Siebert.

This course deals with the religious reformational movements from the death of Dante (1321) to the end of the Council of Trent (1563), including not only those led by Wyclif, Huss, Luther, Calvin, and Zwingli, but also the Counter Reformation within the Roman Catholic Church. Lectures, collateral reading, and discussions.

This course is not open to students who have credit for European History 110.

611. Ancient Christianity. Five credit hours. Autumn Quarter. Four lectures and one quiz each week. Mr. Stuckert.

A detailed survey of the institutions, ideas, and inner life of Christianity in its historical development. The religion is treated objectively as a phase of the cultural and spiritual life of the people of western Europe. The institutional and social aspects of Christianity receive special emphasis from an historical and non-sectarian point of view.

This course is not open to students who have credit for European History 125.

* Not given in 1924-1925.

612. Mediaeval Christianity. Five credit hours. Winter Quarter. Four lectures and one quiz each week. Mr. Stuckert.

This course may be taken independently of European History 611 and 613. When possible it naturally follows 611.

This course is not open to students who have credit for European History 126.

***613. Modern Christianity.** Five credit hours. Spring Quarter. Four lectures and one quiz each week. Mr. Stuckert.

This course is a continuation of European History 611 and 612 but may be taken independently of either.

***614. Northeastern Europe: The Scandinavian Countries and Poland from 1397 A.D. to the Present.** Three credit hours. Autumn Quarter. Three class periods each week.

This course deals with the interrelations and the internal history of the countries concerned, as also with the partitions of Poland and the restoration of that country during the World War. Lectures, collateral reading, and discussions.

615. The Near East: The European Powers versus the Turks. Three credit hours. Spring Quarter. Three class periods each week. Lectures, collateral reading, and discussions. Mr. Siebert.

This course is not open to students who have credit for European History 117.

***616. Europe and Asia: The Far Eastern Question.** Three credit hours. Spring Quarter. Three class periods each week. Mr. Siebert.

This course deals with the significant features of the internal history of India, China, and Japan, and the relations of the western nations to these countries. The work is based in part on textbooks. Lectures, collateral reading, and discussions.

This course is not open to students who have credit for European History 118.

***621. Mediaeval Civilization.** Five credit hours. Winter Quarter. Four lectures and one quiz each week. Ability to read French or German is expected. Mr. McNeal.

The course deals with the origins and characteristics of typical cultural forms of the twelfth and thirteenth centuries; the organization of feudal society, the language and literature of feudal society, castles, monasticism and monastic schools, universities, scholasticisms, cathedrals and religious art, and religious story and drama.

This course is not open to students who have credit for European History 107-108.

622. The Feudal Age. Five credit hours. Winter Quarter. Four lectures and one quiz each week. Ability to read French and German is expected. Mr. McNeal.

The course deals with the political and social history of western Europe from 900 to 1300 A.D., not including England.

This course is not open to students who have credit for European History 138.

* Not given in 1924-1925.

***625. England in the Tudor Period.** Three credit hours. Autumn Quarter. Three class periods each week. Mr. Noyes.

An intensive study of England in the period of transition. Instruction will also be given in methods of advanced historical study including the use of source and other materials relating to the period. Lectures, quiz, and discussions.

This course is not open to students who have credit for European History 153.

***626. England in the Stuart Period.** Three credit hours. Winter Quarter. Three class periods each week. Mr. Noyes.

An intensive study of England in the seventeenth century, including the religious, social, and political causes of the Civil Wars, the Commonwealth, and the Restoration; the Revolution of 1688, and those phases of English history directly affecting colonial settlement in North America. Instruction will also be given in methods of advanced historical study, including the use of source and other materials relating to the period. Lectures, quiz, and discussions.

This course is not open to students who have credit for European History 154.

627. England in the Nineteenth Century to 1867. Three credit hours. Autumn Quarter. Three class periods each week. Mr. Noyes.

This course deals with England from the Napoleonic era to the Second Reform Bill. Including the wars and reconstruction, the era of reform, the early years of Victoria's reign, foreign relations, and the development of the empire. Instruction will also be given in methods of advanced historical study, including the use of source and other materials relating to the period. Lectures, quiz, and discussions.

This course is not open to students who have credit for European History 155.

628. Recent History of England since 1867. Three credit hours. Winter Quarter. Three class periods each week. Mr. Noyes.

This course deals with the late Victorian and post-Victorian periods, including the social, political, and economic development; also with England's part in world affairs, with emphasis on Anglo-American relations and her participation in the World War and the problems of reconstruction. Instruction will also be given in advanced historical methods. Lectures, quiz, and discussions.

This course is not open to students who have credit for European History 156.

631. The French Revolution and Napoleon. Five credit hours. Spring Quarter. Four lectures and one quiz each week. Ability to read French is very desirable, but not required. Advanced students in French language and literature will be admitted without prerequisite. Mr. McNeal.

This course is not open to students who have credit for European History 121.

***632. The Third French Republic.** Five credit hours. Spring Quarter. Four lectures and one quiz each week. The ability to read French is very desirable, but not required. Advanced students of the French language and literature will be admitted without prerequisite. Mr. McNeal.

This course is not open to students who have credit for European History 122.

***635. History of Central Europe from 1648 to 1871 A.D.** Three credit hours. Winter Quarter. Three class periods each week. Lectures, collateral reading, and discussions.

This course is not open to students who have credit for European History 119.

636. History of Central Europe from 1871 A.D. to the Present. Three credit hours. Spring Quarter. Three class periods each week. Lectures, collateral reading, and discussions.

This course is not open to students who have credit for European History 120.

645. The Great Historians. Three credit hours. Autumn Quarter. Three class periods each week. Mr. Stuckert.

This course will consist of lectures on the leading historical writers and schools of the ancient, mediaeval, and modern world and their ideals and methods, accompanied by the reading of selections in translation of the more representative writers. Lectures and selected readings.

The equivalent of European History 129, but may be taken by students having credit in this course.

646. Introduction to Historical Method. Three credit hours. Winter Quarter. Two lecture periods and one quiz and problem period each week. Mr. McNeal.

Lectures on the principles of historical method as applied to European history. a study of the principal kinds of original sources, and the working of problems.

This course is not open to students who have credit for European History 130.

647. The Teaching of European History. Three credit hours. Spring Quarter. Three class periods each week. Required of all who expect to ask the department for recommendation to teaching positions. Mr. Siebert.

Lectures, assigned readings, and discussions. A consideration of methods, arrangement of courses, equipment and textbooks used in secondary schools: followed by practice in preparing lessons for teaching and in conducting recitations in European history. This course will naturally be taken as a continuation of American History 610.

This course is not open to students who have credit for European History 152.

FOR GRADUATES

In accordance with the recent action of the Graduate Council, it is now permitted to offer history (including courses in both American and European history) as a major for the Master's or the Doctor's degree; it is still permitted, however, for the Master's degree to offer American history or European history as either a major or a minor. Students who major in history, or who major in one history department and minor in the other, will be under the supervision of a joint committee of the two departments.

* Not given in 1924-1925.

As is indicated by the courses in the following announcement, the University offers a large opportunity for graduate work in history. The University Library contains about 25,000 volumes on history and about 10,000 additional volumes in parliamentary, congressional, and other records. Students have access also to large collections in the field of history in other libraries of the city, such as the State Library and the Library of the State Historical Society.

HISTORICAL CONFERENCE: In addition to the formal courses indicated below, a monthly conference is held, composed of the instructors and graduate students in the departments of History and Political Science. The discussions in this conference cover a wide range of topics of general interest to students and investigators in these fields.

Prerequisite for Graduate Work: Admission to graduate work in European history presupposes collegiate courses in Mediaeval and Modern history equivalent to European History 401 and 402, and additional courses in European history equivalent to at least two Quarters' work five hours a week or three Quarters' work three hours a week. A reading knowledge of French or German will be required. It is advisable also that the student should have had general college courses in American history, political science, and economics.

802-803-804. Seminary in European History: Problem and Thesis Courses. Two to five credit hours. Autumn, Winter, Spring Quarters. Prerequisite, European History 646. At least three Quarters' work in the seminary are necessary to complete a thesis for the M.A. degree.

The following general fields in which to select some topic or problem for investigation are open to students entering the Seminary in European History:

Greek and Roman Civilization—Mr. Knipping
 French Revolution, Mediaeval Culture—Mr. McNeal
 Church History—Mr. Stuckert
 The Expansion of Europe—Mr. Washburne
 English History—Mr. Noyes
 Modern History, English Constitutional History—Mr. Siebert

FARM CROPS

Office, 101 Horticulture and Forestry Building

PROFESSOR PARK, ASSISTANT PROFESSOR WILLARD, MR. BORST

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in botany and farm crops. Course 602 requires also a fundamental course in zoology.

601. Special Crops. Three credit hours. Autumn Quarter. Two lectures and one two-hour laboratory period each week. Mr. Willard.

This course is a study of tobacco, sugar beets, and other crops of great local interest which are not taken up in the general courses. The work is largely individual, and the student may put the greater part of his time on the crop or crops of most interest to him.

This course is not open to students who have credit for Farm Crops 112.

602. Plant Breeding. Five credit hours. Winter Quarter. Four lectures and one two-hour laboratory period each week. Mr. Park.

Application of the principles of genetics to the breeding of our important agricultural plants. Laboratory study of cereal hybrid populations, practice in crossing plants, and study of the technique involved in plant breeding work.

This course is not open to students who have credit for Farm Crops 113.

603. Crop Experimentation. Three credit hours. Spring Quarter. Two lecture periods and the equivalent of two laboratory hours each week. Mr. Borst.

This course is a brief study of the methods of crop experimentation in the field, the sources of error involved and the interpretation of results. It is intended for those preparing for research or teaching in farm crops or related lines. Several trips will be taken, including one to Wooster.

605. Advanced Grain Grading and Judging. Five credit hours. Autumn Quarter. Ten laboratory hours each week. Mr. Willard.

A course for students desiring further training in the handling of farm crops including market grading, judging, and identification of grains and forage crops. Trips to local fairs for practice will be arranged where possible.

701. Minor Investigations. Three to fifteen credit hours. May be taken in units of three to five credit hours for one, two, or three Quarters. Autumn, Winter, Spring Quarters. Prerequisite, the consent of the instructor. Mr. Park, Mr. Willard.

Special problems in the culture, utilization, classification, grading, breeding, and improvement of farm crops may be studied in the field, laboratory, or library.

This course is not open to students who have credit for Farm Crops 119 and 120.

FOR GRADUATES

Prerequisite for Graduate Work: As a prerequisite for graduate work in farm crops students must have had at least one year's work in college botany, one year's work in college chemistry, an introductory course in soils, and one year's work in farm crops.

801. Research in Plant Breeding and Crop Production. Five to ten credit hours. Any Quarter. Mr. Park, Mr. Willard.

802. Seminary. One credit hour. Autumn, Winter, Spring Quarters. Required of all graduate students majoring in farm crops.

FINE ARTS

Office, 302 Hayes Hall

PROFESSOR HOPKINS, ASSISTANT PROFESSOR FANNING

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in fine arts and the permission of the instructor.

***656. History of Oriental Art.** Five credit hours. Winter Quarter. Five lectures each week.

* Not given in 1924-1925.

The painting, sculpture, and architecture of China and Japan, with some consideration of the art of India. Illustrated lectures, reading, and reports.

This course is not open to students who have credit for Art 157.

657-658-659. Proseminary. Five credit hours. Autumn, Winter, Spring Quarters. Mr. Fanning.

Specialized study in important European art periods. Different periods will be elected in different Quarters, thereby going more deeply into narrower fields than in the more general courses which are prerequisites.

Equivalent to Art 165-166, but open to students who have credit for these courses.

661-662-663. Advanced Technical Problems. Three to five credit hours. Autumn, Winter, Spring Quarters. Mr. Hopkins.

This course is open, by permission of the department, to students who have shown particular ability in drawing, painting, or sculpture and who wish to pursue advanced problems in these fields under the supervision of the department.

FRENCH

(See Romance Languages and Literatures)

GEOGRAPHY

(See Economic and Social Geography and Geology)

GEOLOGY

Office, 103 Orton Hall

PROFESSORS BOWNOCKER AND CARMAN, ASSISTANT PROFESSOR PEATTIE,
MR. WEBB, MR. STOCKDALE, MISS STEWART

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in geology in addition to any prerequisites stated in the description of the courses. Courses 605, 606, 607, and 616 require also a fundamental course in chemistry.

601. Advanced Paleontology. Three or four credit hours. Autumn Quarter. Laboratory work. Mr. Carman, Miss Stewart.

The identification of faunas of various geological formations, particularly those of Ohio.

602. Advanced Paleontology. Three or four credit hours. Winter Quarter. Mr. Carman, Miss Stewart.

This is a continuation of Geology 601.

603. Advanced Paleontology. Three or four credit hours. Spring Quarter. Mr. Carman, Miss Stewart.

This is a continuation of Geology 602.

604. Advanced Physiography. Five credit hours. Winter Quarter. Recitations, lectures, and laboratory. Mr. Webb.

A study of the origin and history of the physiographic features of the earth's surface, including detailed analyses of processes involved in stream action, glaciation, and the evolution of shore lines.

This course is not open to students who have credit for Geology 115.

605. Economic Geology. Three credit hours. Autumn Quarter. Three recitations or lectures each week. Mr. Bownocker.

A study of the nature of ores, their classification and origin; the metallic ores of the United States.

This course is not open to students who have credit for Geology 167.

606. Economic Geology. Three credit hours. Winter Quarter. Three recitations or lectures each week. Mr. Bownocker.

A study of the properties and uses of coal, the coal deposits of the United States, lime, cement, clays, etc.

This course is not open to students who have credit for Geology 170.

607. Economic Geology. Three credit hours. Spring Quarter. Three recitations or lectures each week. Mr. Bownocker.

A study of petroleum, asphaltum, and natural gas; their distribution, geological relations, and origin.

This course is not open to students who have credit for Geology 170.

***608. Stratigraphic Geology of Ohio.** Five credit hours. Autumn Quarter. Students intending to elect this course should consult the instructor before registering.

Field trips, laboratory work, lectures, and assigned readings. Field trips on Saturdays (entire day) while the weather permits.

The geological formations of central Ohio are studied in the field and those formations more distant from Columbus are studied by rock specimens and assigned readings. This course is intended to acquaint the student with the ordinary methods of field investigation, such as the measurement and description of geological sections, the making of geological maps, the collection and identification of specimens, and the preparation of reports describing the regions studied.

This course is not open to students who have credit for Geology 105 or 405.

611. Areal Geology. Three to five credit hours. One Quarter. Autumn and Spring. Lectures, laboratory, and field work. Prerequisite, the consent of instructor. Mr. Carman, Mr. Webb, Mr. Stockdale.

Instruction in the standard methods of field work and in preparing geological maps and reports. Field study and mapping of geological formations or surficial deposits of an assigned region followed by the preparation of a report.

612. Special Problems. Three to five credit hours. Autumn, Winter, Spring Quarters. Assigned readings, conferences, and reports.

* Not given in 1924-1925.

Prerequisite, the consent of instructor. (A) Historical Geology, Mr. Carman. (B) Economic Geology, Mr. Bownocker. (C) Physiography, Mr. Webb. (D) Geography, Mr. Peattie.

A study of special topics, conferences, and reports.

615. Geological Surveying. Five credit hours. Spring Quarter. Two recitations and three field or laboratory periods each week. Students intending to elect this course should consult the instructor. Mr. Stockdale.

A study of the construction and interpretation of topographic and geologic maps, with special emphasis on instrument and map work in connection with oil surveying. Field practice in various methods of triangulation, traversing, and topographic sketching. Instruments used include plane table, telescopic alidade, open sight alidade, aneroid barometer, hand level, stadia, and compass.

616. Clays. Five credit hours. Winter Quarter. Recitations, lectures, and assigned readings.

The properties, distribution, uses, and origin of clays. Emphasis will be given to the clays of Ohio.

FOR GRADUATES

Prerequisite for Graduate Work: The courses named below presuppose two years' work of collegiate character in geology, which will usually consist of the general courses in physiography and inorganic and historical geology. If the student intends to specialize in historical geology he should have had, in addition to the above, general courses in chemistry, zoology, and botany; if in inorganic geology, general courses in chemistry, physics, and mineralogy; if in physiography, general courses in physics and chemistry.

801. Advanced Historical Geology. Three credit hours. Autumn Quarter. Lectures and laboratory. Mr. Carman.

A study of the physical history of the North American continent and of the life development which has taken place upon it. The lithology, subdivisions, geographical distribution, and fossils of each system are studied and from these the geological history of the time is interpreted.

802. Advanced Historical Geology. Three credit hours. Winter Quarter. Mr. Carman.

This is a continuation of Geology 801.

803. Advanced Historical Geology. Three credit hours. Spring Quarter. Mr. Carman.

This is a continuation of Geology 802.

804. Research Work. Three to five credit hours. Autumn Quarter. Field, laboratory, and library study. Outline of work and time will be arranged with individual students. (A) Stratigraphy and Paleontology, Mr. Carman. (B) Economic Geology, Mr. Bownocker. (C) Physiography, Mr. Webb. (D) Geography, Mr. Peattie.

805. Research Work. Three to five credit hours. Winter Quarter. This is a continuation of Geology 804.

806. Research Work. Three to five credit hours. Spring Quarter. This is a continuation of Geology 805.

GERMAN

Office, 317 University Hall

PROFESSORS M. B. EVANS, EISENLOHR, AND BLOOMFIELD,
ASSISTANT PROFESSORS THOMAS AND FEISE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for Courses in This Group: Proseminary, 675, and 685 require six Quarters of German; 665 and 695, the permission of the instructor.

Proseminary: Eighteenth and Nineteenth Century Literature. Three credit hours. Autumn, Winter, Spring Quarters. Three hours lecture and quiz each week. All instructors.

This group of courses is intended to serve as an introduction to a more intensive study of German literature. There will be informal lectures in German and English, discussions and reports; also practice in speaking and writing German. The list of authors to be studied will vary from year to year.

631. Autumn Quarter, 1924. Heine, a study of his life and works. Miss Thomas.

612. Winter Quarter, 1925. Goethe's Faust. Mr. Evans.

641. Spring Quarter, 1925. Selected dramas of Hauptmann and a study of recent tendencies in German drama. Mr. Feise.

655. Phonetics. Three credit hours. Autumn Quarter. Three hours lecture and quiz each week. Mr. Bloomfield.

Speech sounds with special reference to German, French, and English.

This course is not open to students who have credit for German 175.

665. The Teaching of German. Three credit hours. Autumn Quarter. Three hours lecture and quiz each week. Mr. Evans.

A critical study of the methods of teaching modern foreign languages. Lectures, reports, and practice teaching.

This course is not open to students who have credit for German 173.

675. Introduction to German Philology. Three credit hours. Spring Quarter. Three hours lecture and quiz each week. Mr. Bloomfield.

The study of texts illustrating the history of the German language.

685. Advanced Composition. Three credit hours. Winter Quarter. Three hours lecture and quiz each week. Mr. Eisenlohr.

An advanced course in speaking and writing German, accompanied by a review of German syntax.

695. Minor Investigations. Three credit hours. Autumn, Winter, Spring Quarters. Mr. Evans, Mr. Eisenlohr, Mr. Bloomfield, Miss Thomas, Mr. Feise.

Investigations of minor problems in the various fields of German literature and philology.

FOR GRADUATES

Prerequisite for Graduate Work: At least eight Quarters of work of college grade or the equivalent.

Candidates for the Master's degree should consult with the department before arranging their course.

*801. Advanced Middle High German. Three credit hours.

*805. Gothic. Three credit hours.

*810. Old High German. Three credit hours.

850-851-852. Seminary in German Literature. Three credit hours. Autumn, Winter, Spring Quarters. Mr. Evans.

The development of the German drama from its beginning to Lessing, with special attention to the *mise en scene*. Lectures, reports, and assigned readings.

GREEK LANGUAGE AND LITERATURE

Office, 200A University Hall

PROFESSOR BOLLING

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Courses 601 and 610 require a course in elementary Greek. There are no prerequisites for 650, 651, 652, and 701 other than the permission of the instructor. For 650, 651, and 652 a knowledge of Greek is not required.

601. Reading and Lectures. Three to five credit hours. One Quarter. Winter and Spring. Three to five meetings each week. Mr. Bolling.

Study of the language, style, and works of some author or group of authors, chosen to meet the particular needs of the class. The course may consequently be repeated.

This course is not open to students who have credit for Greek 151 or 152.

610. Private Reading and Minor Problems. Two to five credit hours. Autumn, Winter, Spring Quarters. Mr. Bolling.

Passages for private reading and topics for investigation will be suggested to meet the needs of individual students.

650. Greek Art. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Bolling.

Description and discussion of the monuments of the pre-historic period—the civilization of Crete and Mycene.

651. Greek Art. Three credit hours. Winter Quarter. Three lectures each week. Mr. Bolling.

The history of Greek vase painting.

This course is not open to students who have credit for Greek 115.

* Not given in 1924-1925.

652. Greek Art. Three credit hours. Spring Quarter. Three lectures each week. Mr. Bolling.

The history of Greek sculpture.

This course is not open to students who have credit for Greek 116.

701. Principles of the Historical Study of Language. Three credit hours. Spring Quarter. Three lectures each week. Mr. Bolling.

The elements of linguistic science together with an outline of the Indo-European family of languages.

This course is not open to students who have credit for Greek 141.

HISTORY

(See American History and European History)

HISTORY OF EDUCATION

Office, 202 Hayes Hall

PROFESSORS ANDERSON AND PENNEY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: An acceptable course in the history of education.

601. Educational Classics. Four credit hours. Spring Quarter. Four lectures each week. Mr.

Readings in Plato, Aristotle, Plutarch, Quintilian, Montaigne.

This course is not open to students who have credit for History of Education 105 or 350 or 351.

602. Educational Classics. Four credit hours. Autumn Quarter. Four lectures each week. Mr.

Readings in Comenius, Locke, Rousseau, Pestalozzi, Herbart, Froebel.

This course is not open to students who have credit for History of Education 106.

603. Comparative Education. Two credit hours. Autumn Quarter. Two lectures each week. Mr. Anderson.

A survey with historical introduction of existing systems of elementary and secondary education in Denmark, England, and two or three of the United States.

This course is not open to students who have credit for History of Education 107.

604. Comparative Education. Two credit hours. Spring Quarter. Two lectures each week. Mr.

A survey, with historical introduction, of existing systems of education in Germany and France.

This course is not open to students who have credit for History of Education 108.

605. History of Education in the United States. Two credit hours. Winter Quarter. Two lectures each week. Mr. Anderson.

This course is not open to students who have credit for History of Education 109.

606. History of Education in the United States. Two credit hours. Spring Quarter. Two lectures each week. Mr. _____.

This course is not open to students who have credit for History of Education 110.

607. History of Industrial Education. Two credit hours. Winter Quarter. Two lectures each week. Mr. Anderson.

This course is not open to students who have credit for History of Education 112.

608. History of the American High School. Two credit hours. Spring Quarter. Two lectures each week. Mr. Eckelberry.

An historical and comparative study of the American high school.

This course is not open to students who have credit for History of Education 113 or 114.

610. Present-Day Problems in Education. Two credit hours. Spring Quarter. Two lectures each week. Mr. _____.

This is a continuation of History of Education 609.

FOR GRADUATES

Prerequisite for Graduate Work: Students must have work in education amounting to at least eighteen hours in order to take graduate work in this department. A reading knowledge of German, French, Latin, or Greek is highly desirable.

802-804. Seminary in the History of Education. Two to five credit hours. Autumn and Spring Quarters. Required of all students majoring in the history of education. Mr. Anderson, Mr. _____.

803. A Survey of Source Materials and of General Literature in the Field of the History of Education. Two credit hours. Winter Quarter. Two lectures or conferences each week. Mr. Anderson.

HOME ECONOMICS

Office, 220 Campbell Hall

PROFESSORS LANMAN, ADAMS, AND WALKER, ASSISTANT PROFESSORS FINDLEY, MCGILL, AND MCKAY, MISS DONNELLY, MISS STEIGER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in home economics in addition to any prerequisites stated in the description of the courses.

Course 611 requires also fundamental courses in physiology and agricultural chemistry; 621 and 641 require also a course in psychology.

611. Nutrition. Five credit hours. One Quarter. Autumn, Winter, Spring. Three three-hour periods each week for lecture and laboratory. Miss McKay, Miss Steiger.

A study of the fundamental principles of human nutrition and their application to the feeding of individuals and groups under varying physiological and economic conditions.

This course is not open to students who have credit for Home Economics 110.

612. Advanced Nutrition. Five credit hours. Spring Quarter. Three three-hour periods of lecture and laboratory each week. Prerequisite, Home Economics 611. Miss McKay.

A study of the adaptation of diet to disorders of nutrition.

This course is not open to students who have credit for Home Economics 133.

617. Household Management. Five credit hours. One Quarter. Autumn, Winter, Spring. Four lectures each week and laboratory to be arranged. Prerequisites, Home Economics 611 and economics. Mrs. Walker, Miss Steiger, Miss McKay.

A study of the organization and management of the household with a view to securing the maximum of family welfare. Time is given to a consideration of the problems of expenditure through a study of relative values, examination of budgets, and discussion of factors influencing choice.

The Home Economics practice apartment and house where the students live in groups for a period of time, afford opportunity for practice in household management.

This course is not open to students who have credit for Home Economics 119.

621. Child Care. Five credit hours. One Quarter. Winter and Spring. Five lectures each week. Prerequisite or concurrent, Home Economics 617 and sociology. Miss Lanman, Mrs. Adams, Mrs. Walker, Miss McKay, and others.

A study of the hygiene of maternity and infancy and of the physical, mental, and spiritual development of the child, the influence of heredity and environment, and the responsibility of society toward the child.

631. Institutional Management. Five credit hours. One Quarter. Autumn and Winter. Credit will not be given until the following course, Home Economics 632, has been completed. Two lectures and two three-hour laboratory periods each week. Prerequisite, Home Economics 611; prerequisite or concurrent, Home Economics 617. Miss Findley.

This course considers the organization, administration, equipment, and accounting in various types of institutions and the buying, preparation, and serving of food in large quantities. Laboratory practice is given in cafeteria work and in catering. Observations are made in restaurants, tea rooms, hotels, schools, and hospitals. Practice may be arranged in various institutions.

632. Institutional Management. Five credit hours. One Quarter. Winter and Spring. Two two-hour periods each week for lecture and

laboratory and other hours to be arranged. Prerequisites, Home Economics 631 and consent of the instructor. Miss Findley.

This is a continuation of Home Economics 631.

633. School Lunchroom Management. Three credit hours. Spring Quarter. One lecture and two two-hour laboratory periods each week. Prerequisite or concurrent, Home Economics 611 and 641. Miss Findley.

This course is arranged for those who wish to be prepared to manage school lunchrooms in connection with their teaching. It consists of a study of equipment, organization, and management, with observations and practice in city and rural school lunchrooms.

641. Home Economics Teaching. Five credit hours. One Quarter. Autumn, Winter, Spring. Six lectures each week for the first six weeks of any Quarter. Prerequisite, thirty-five Quarter-credit hours in required courses in Home Economics. Mrs. Adams, Miss Donnelly.

This course is given as preparation for supervised or practice teaching in home economics. It includes a brief history of home economics instruction and its development to cope with present-day needs. The course will be developed with lectures and class discussions on the organization of home economics courses for various types of schools; planning of lessons; equipment of laboratories; classroom management and organization of home-project work. Vocational education will be emphasized. Observation trips will be scheduled and practice given in demonstration lessons.

This course is not open to students who have credit for Home Economics 127.

642. Supervised Home Economics Teaching. Five credit hours. One Quarter. Autumn, Winter, Spring. Six lectures each week for the second six weeks of any Quarter. Prerequisite, Home Economics 641. Mrs. Adams.

This course will give an opportunity to teach classes in a city high school, rural and village schools, evening schools, and settlements. Each student will make observations and reports and will be required to teach approximately thirty class exercises. This training will prepare for teaching certification under the Smith-Hughes Act.

This course is not open to students who have credit for Home Economics 128.

701. Special Problems in Home Economics. Three to fifteen credit hours for one Quarter or more. To be given in units of three or five hours. Autumn, Winter, Spring Quarters. One conference or more each week. Prerequisite, twenty-five Quarter-credit hours in the required courses in Home Economics and consent of the instructor. Miss Lanman, Mrs. Walker, Mrs. Adams, Miss McKay.

Reading and reports on home economics topics. Problems chosen for individual study.

This course is not open to students who have credit for Home Economics 105 and 106.

FOR GRADUATES

801. Advanced Special Problems in Home Economics. Three to fifteen credit hours for one Quarter or more. To be given in units of

three to five hours. Autumn, Winter, Spring Quarters. Miss Lanman, Mrs. Adams, Mrs. Walker, Miss McKay.

Investigational work bearing upon the problems of living, either in the home, the institution or under commercial conditions.

HORTICULTURE AND FORESTRY

Office, 118 Horticulture and Forestry Building

PROFESSORS PADDOCK AND MONTGOMERY, ASSISTANT PROFESSORS
SCHERER AND HOTTES

Prerequisite for All Courses in This Department: In general, the prerequisites for the "600" courses in pomology, vegetable gardening, floriculture, and farm woodlot are fundamental courses in these subjects and the permission of the instructor, in addition to any prerequisites stated in the description of the courses.

POMOLOGY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

601. Horticultural Plant Breeding. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Hottes.

A study of the methods of breeding of horticultural crops; the modification and improvement of plants under cultivation, together with a discussion of the theories of heredity.

This course is not open to students who have credit for Horticulture 107.

602. Experimental Horticulture. Three credit hours. Autumn Quarter. One lecture each week. Theses work arranged. Mr. Paddock.

The methods of experimentation and research. The limitations of demonstration and research are pointed out and the functions of the experiment station are emphasized. Recorded experiments are studied and criticized and special problems for experimentation are planned. Technical problems are assigned, which are to be presented as theses. This work not only gives practice in the application of exact methods, but affords opportunity to become familiar with the literature as well.

This course is not open to students who have credit for Horticulture 109.

603. Experimental Horticulture. Three credit hours. Winter Quarter. One lecture each week. Theses work arranged. Prerequisite, Horticulture 602, and the two courses must be taken consecutively. Mr. Paddock.

This is a continuation of Horticulture 602.

This course is not open to students who have credit for Horticulture 110.

604. Systematic Pomology. Five credit hours. Autumn Quarter. Four lectures and one two-hour laboratory period each week. Mr. Paddock.

Nomenclature, classification, and identification of fruits; detailed descriptions, botanical relationships, adaptations, and commercial value of the commercial orchard fruits of the region.

This course is not open to students who have credit for Horticulture 121.

605. The Literature of Horticulture. Five credit hours. Winter Quarter. Four lectures and one two-hour laboratory period each week. Paddock.

A study of the literature of horticulture.

This course is not open to students who have credit for Horticulture 122.

606. Advanced Pomology. Five credit hours. Spring Quarter. Four lectures and one two-hour laboratory period each week. Mr. Paddock.

An interpretation of pomological practice in terms of recent investigations.

701. Minor Investigations. Three to fifteen credit hours, taken in units of three or five hours each Quarter for one or more Quarters. Autumn, Winter, Spring Quarters. Mr. Paddock, Mr. Montgomery, Mr. Hottes.

This course is for students who desire to work out special problems in the fields of pomology, vegetable gardening or floriculture. Students will elect work in their desired subjects after a conference with the instructor in charge.

VEGETABLE GARDENING

FOR ADVANCED UNDERGRADUATES AND GRADUATES

621. Systematic Vegetable Gardening. Five credit hours. Autumn Quarter. Three lectures and one four-hour laboratory period each week. Mr. Montgomery.

A systematic study of the botany, origin, and history of the principal vegetable forms and varieties, including their description, identification, and special characteristics as regards table and market quality, adaptation to soils, and resistance to diseases.

This course is not open to students who have credit for Horticulture 131.

FARM WOODLOT

FOR ADVANCED UNDERGRADUATES AND GRADUATES

651. Minor Investigations in Forestry. Three or five credit hours. One Quarter. Autumn, Winter, Spring. Mr. Scherer.

An opportunity is given the student to make a special study of any phase of forestry.

FOR GRADUATES

Prerequisite for Graduate Work: Candidates must hold the degree of Bachelor of Science in Horticulture or its equivalent.

801. Research. Five to ten credit hours. Autumn, Winter, Spring Quarters. Graduate students may do investigational work in some phase of the following subjects: pomology, horticulture, plant breeding, and floriculture. Mr. Paddock, Mr. Montgomery, Mr. Hottes.

INDUSTRIAL EDUCATION

(MANUAL TRAINING)

Office, 212 Shops Building

PROFESSOR USRY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for Advanced Work in This Department: Acceptable courses in the field of education.

626. Special Problems in Industrial Education. Two credit hours. One Quarter. Winter and Spring. Two lecture periods each week. Mr. Usry.

A course designed primarily for administrators. Readings and discussions relative to legislation and progress in the field of industrial education, organization from the administrator's viewpoint, teachers, relative costs, provision in building plans for shops.

This course is not open to students who have credit for Industrial Education 123.

ITALIAN

(See Romance Languages and Literatures)

JOURNALISM

Office, Journalism Building

PROFESSORS MYERS AND HOOPER, ASSISTANT PROFESSOR GETZLOE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in journalism in addition to any prerequisites stated in the description of the courses.

607. Newspaper Problems. Two credit hours. One Quarter. Autumn and Spring. One recitation and one laboratory period each week on the Lantern. Mr. Myers.

Consideration of the problems of newspaper work and direction, including advertising and circulation. Individual theses are required.

This course is not open to students who have credit for Journalism 109.

608. Newspaper Problems. Two credit hours. Winter Quarter. One recitation and one laboratory period each week on the Lantern. Prerequisite, Journalism 607. Mr. Myers, Mr. Getzloe.

This is a continuation of Journalism 607.

This course is not open to students who have credit for Journalism 110.

621. Editorial Writing. Three credit hours. One Quarter. Autumn and Spring. Three recitations each week. Mr. Hooper.

Study of the purpose, form, style, and spirit of the editorial, as well as the responsibility of the writer to the newspaper, the community and the profession. Consideration of current events, practice in news interpretation and other editorial writing, and study of editorial pages.

This course is not open to students who have credit for Journalism 107.

622. Public Opinion in the Making. Three credit hours. Winter Quarter. Three recitations each week. Mr. Hooper.

Continuation of the study of the editorial, with special reference to leadership. Dramatic, music and literary criticism. Consideration of current events, and practice in editorial writing.

This course is not open to students who have credit for Journalism 108.

LATIN LANGUAGE AND LITERATURE

Office, 307 University Hall

PROFESSORS HODGMAN AND ELDEN, MR. SMITH

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Acceptable courses in Latin in addition to any prerequisites stated in the description of the courses, except for 606, 607, and 608 which do not require a Latin prerequisite. As a rule, six Quarters of college Latin fulfills the Latin prerequisite.

601. Catullus, Pliny, Tacitus. Three credit hours. Autumn Quarter. Three recitations each week. Mr. Elden.

Selections from Catullus, Pliny's Letters, or Tacitus.

This course is not open to students who have credit for Latin 103.

602. Latin Satire. Three credit hours. Spring Quarter. Three recitations each week. Mr. Elden.

Selections from the Satires of Horace or Juvenal.

This course is not open to students who have credit for Latin 105.

603. Advanced Reading. Three credit hours. Autumn Quarter. Three recitations each week. Mr. Hodgman.

The authors read in this course will be chiefly of the Silver Latin period and will vary from year to year.

This course is not open to students who have credit for Latin 121.

604. Advanced Reading. Three credit hours. Winter Quarter. Three recitations each week. Prerequisite, Latin 601. Mr. Hodgman, Mr. Elden.

Selections from Lucretius, Vergil, or Seneca.

This course is not open to students who have credit for Latin 121.

605. Legal Latin. Three credit hours. Spring Quarter. Three recitations each week. Prerequisite, Latin 601 or sufficient Latin to qualify a student for the course. Mr. Smith.

Selections from writers on the Roman Law.

This course is not open to students who have credit for Latin 127.

606. Comparative Literature. Three credit hours. Spring Quarter. Three lectures each week. Mr. Elden.

This consists of lectures on Latin literature and its influence upon the literatures of France, Germany, and England. No knowledge of Latin is required, and the course is open to students of both ancient and modern literatures.

This course is not open to students who have credit for Latin 111.

607. Roman Private Life. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Elden.

Lectures, illustrated with lantern slides on the daily life and customs of the Romans, their business and family relations, their amusements, dress, homes, and household furniture. A knowledge of Latin is not required for this course, and it is open to all students who are interested in the subject.

This course is not open to students who have credit for Latin 107.

608. Roman Art and Archaeology. Three credit hours. Spring Quarter. Three lectures each week. Mr. Elden.

Lectures, illustrated with lantern slides on the daily life and customs of the ancient Roman world, with special reference to the city of Rome and its topography; also the architecture and decorative arts of the Romans, temples, palaces, private and public buildings and their construction. A knowledge of Latin is not required for this course.

This course is not open to students who have credit for Latin 109.

609. Historical Latin Grammar: Inflections. Three credit hours. Spring Quarter. Three lectures each week. Prerequisite, Latin 603. Mr. Hodgman.

Sounds and inflections, and other topics essential to the understanding of the principles which govern the development of the Latin language. Latin 609 is deemed essential for those who make Latin a major or minor subject of study in graduate work, and is recommended for advanced undergraduate study.

This course is not open to students who have credit for Latin 123-124.

***610. Roman Religion.** Three credit hours. One Quarter. Three lectures each week. Mr. Hodgman.

Lectures on the development of Roman religion, with readings from the *Fasti* of Ovid. This course is valuable as supplementing the courses on the life and literature of the Romans.

* Not given in 1924-1925.

This course is not open to students who have credit for Latin 201-202.

611. Roman Public Life. Three credit hours. Spring Quarter. Three lectures each week. Mr. Smith.

A brief study of the development of Roman governmental institutions, with special attention to their functions and character during the late republic and early empire.

This course is not open to students who have credit for Latin 131-132.

612. Latin Prose Composition: First Course. Three credit hours. Winter Quarter. Three recitations each week. Mr. Hodgman.

Exercises and lectures on Latin idiom and style.

This course is not open to students who have credit for Latin 115.

613. Latin Prose Composition: Second Course. Three credit hours. Spring Quarter. Three recitations each week. Prerequisite, Latin 612. Mr. Hodgman.

This is a continuation of Latin 612.

This course is not open to students who have credit for Latin 116.

***614. Latin Prose Composition: Advanced Course.** Three credit hours. One Quarter. Three recitations each week. Prerequisite, Latin 613. Mr. Hodgman.

A study of the more difficult points of Latin idiom and style.

This course is not open to students who have credit for Latin 119-120.

615. Proseminary I. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Elden.

Lectures on topics suggested by the study of Caesar and Cicero. Roman writing and Roman writing materials; story of the manuscripts; oratory and the orations; Letters of Cicero. Latin 615 is designed especially for students preparing to teach Latin.

This course is not open to students who have credit for Latin 113.

616. Proseminary II. Three credit hours. Spring Quarter. Three lectures each week. Mr. Elden.

Lectures on the life and works of Vergil, and his influence on modern literature. Latin 616 is designed especially for students preparing to teach Latin.

This course is not open to students who have credit for Latin 114.

617. Methods of Teaching Latin. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Hodgman, Mr. Elden.

Lectures and assigned readings on methods of teaching Latin in the secondary schools. Place and value of Latin in education; bibliography; illustrative exercises in the Latin authors used in high schools.

This course is not open to students who have credit for Latin 129.

618. Elements of Epigraphy. Three credit hours. Winter Quarter. Three recitations each week. Mr. Smith.

* Not given in 1924-1925.

Egbert's Introduction to the Study of Latin Inscriptions.

This course is not open to students who have credit for Latin 213-214.

***619. Historical Latin Grammar: Syntax.** Three credit hours. One Quarter.

Lectures on the origin and development of Latin syntax.

This course is not open to students who have credit for Latin 125-126.

MANUAL TRAINING

(See Industrial Education)

MATHEMATICS

Office, 314 University Hall

PROFESSORS BOHANNAN, McCOARD, KUHN, RASOR, C. C. MORRIS AND
ARNOLD, ASSISTANT PROFESSORS PRESTON, BAREIS, WEAVER,
BEATTY, AND CARIS, MR. BUMER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental course in calculus in addition to any prerequisites stated in the description of the courses. Course 661 requires also a course in physics; 693, a course in the mathematics of insurance.

601. Advanced Calculus. Five credit hours. Autumn Quarter. Five recitations each week.

Selected topics from Osgood's Calculus.

This course is not open to students who have credit for Mathematics 165.

***603. Advanced Calculus.** Five credit hours. Spring Quarter. Five recitations each week. Prerequisite, Mathematics 601 or 165. Mr. Bohannon.

Selected topics from Byerly's Integral Calculus and Wilson's Advanced Calculus.

This course is not open to students who have credit for Mathematics 166.

607. Introduction to the Theory of Functions of a Complex Variable. Five credit hours. Winter Quarter. Five recitations each week. Prerequisite, Mathematics 601. Mr. Rasor.

An introductory course in the theory of functions of a complex variable.

611. Differential Equations. Five credit hours. Winter Quarter. Five recitations each week. Mr. Bohannon.

This course is not open to students who have credit for Mathematics 167.

* Not given in 1924-1925.

612. Differential Equations. Five credit hours. Spring Quarter. Five recitations each week. Prerequisite, Mathematics 611 or 167. Mr. Bohannon.

This course is not open to students who have credit for Mathematics 168.

621. Advanced Euclidian Geometry. Five credit hours. Winter Quarter. Five recitations each week. Mr. Weaver.

Geometric constructions; points lines and circles associated with a triangle; harmonic ranges and pencils; harmonic properties of the circle; radical axis; pole and polar with respect to a circle; inversion; symmedian points; Brocard points. This is chiefly a problem course in the field of plane geometry, and is of special value to teachers of this subject.

This course is not open to students who have credit for Mathematics 149-150.

623. Projective Geometry. Five credit hours. Spring Quarter. Five recitations each week. Miss Bareis.

Projection and section, duality, cross ratio, involution. Theorems of Desargues, Pascal and Brianchon, construction problems of the first and second degree.

This course is not open to students who have credit for Mathematics 171-172.

625. Plane and Solid Analytic Geometry. Five credit hours. Winter Quarter. Five recitations each week. Miss Bareis.

This course is not open to students who have credit for Mathematics 163-164.

641. Elementary Theory of Equations. Five credit hours. Autumn Quarter. Five recitations each week. Mr. Kuhn.

Construction with ruler and compasses, numerical equations, determinants, symmetric functions. Text: Dickson's First Course in the Theory of Equations.

This course is not open to students who have credit for Mathematics 173.

***643. Theory of Numbers.** Five credit hours. Winter Quarter. Five recitations each week. Prerequisite, Mathematics 641 or 173. Mr. Kuhn.

Elementary properties of integers and the theory of congruences with simple applications.

This course is not open to students who have credit for Mathematics 174.

661. Vector Analysis. Five credit hours. Spring Quarter. Five recitations each week. Prerequisite, Mathematics 601 or 165. Mr. Bumer.

Vector and scalar algebra and geometry, differentiation and differential operators, applications to electrical theory and to mechanics, dynamics, and hydro-dynamics. Text: Coffin's Vector Analysis.

This course is not open to students who have credit for Mathematics 204.

* Not given in 1924-1925.

***671. Introduction to the Theory of Relativity.** Five credit hours. Spring Quarter. Five recitations each week. Prerequisite, Mathematics 661.

This course will be prefaced by a brief review of those parts of the classical theories of dynamics and physics which are necessary to an understanding of the Special Theory of Relativity, its applications, and the elementary aspects of the General Theory of Relativity.

681. The Teaching of Mathematics. Three credit hours. Autumn Quarter. Three recitations each week. Lectures, discussions, and practice teaching. Mr. Arnold.

The educational value of the study of mathematics; the content matter of the various courses in secondary and early collegiate mathematics; modes and methods; recent and contemporary studies of the teaching of mathematics.

This course is not open to students who have credit for Mathematics 186.

684. Materials and Concepts of Elementary Mathematics. Five credit hours. Winter Quarter. Five recitations each week. Mr. Arnold.

A critical review of the selection of the materials of secondary mathematics—the history of the development of this material and its underlying concepts. Systems of axioms for algebra; for geometry; the axiom of parallels. The Non-Euclidian Geometries. Construction with rules and compass. Variables, limits, number, infinity, transcendence.

***685. The History of Mathematics.** Five credit hours. Spring Quarter. Five recitations each week. Mr. Arnold.

A survey of the development of elementary and secondary mathematics in ancient, mediaeval, and modern times, including a sketch of the history and teaching of mathematics in the United States.

This course is not open to students who have credit for Mathematics 125-126.

691. Probability. Five credit hours. Autumn Quarter. Five recitations each week. Mr. Morris.

The theory of probability and its application to the construction of mortality tables. Merriman's Least Squares and Henderson's Mortality Tables.

This course is not open to students who have credit for Mathematics 181.

693. Actuarial Theory. Five credit hours. Winter Quarter. Five recitations each week. Prerequisite, Mathematics 691 or 181. Mr. Morris.

Life contingencies; actuarial principles of fire and accident insurance; workmen's compensation, and pension systems.

This course is not open to students who have credit for Mathematics 183-184.

694. Advanced Actuarial Theory. Five credit hours. Spring Quarter. Five recitations each week. Prerequisite, Mathematics 693 or 183-184. Mr. Morris.

* Not given in 1924-1925.

Construction of mortality and rate tables, policy values and dividend sheets.

This course is not open to students who have credit for Mathematics

187.

FOR GRADUATES

Prerequisite for Graduate Work: As a qualification for the study of mathematics as a graduate "major" the student must have completed previously the equivalent of at least two years of college mathematics, including calculus.

It is recommended that students intending to specialize in mathematics, acquire, as soon as possible, a reading knowledge of French, German, and Italian.

NOTE: Students should consult with instructors before registering for courses open only to graduates.

805. Functions of a Real Variable. Five credit hours. Spring Quarter. Five recitations each week. Prerequisite, Mathematics 601 or 165. Mr. Kuhn.

Limits, the nature of numbers, point-sets, functional relations, infinite series and continuity, differentiability of functions, with applications.

This course is not open to students who have credit for Mathematics 215-216.

***806. Theory of Functions of a Complex Variable.** Five credit hours. Spring Quarter. Five recitations each week. Mr. Rasor.

The algebra and calculus of complex numbers with their corresponding geometric representation; conformal representation; theory of power series; definition and properties of analytic functions; introduction to the theory of functions as developed by Cauchy, Riemann, and Weierstrass.

This course is not open to students who have credit for Mathematics 201-202.

***816. Calculus of Variations.** Five credit hours. Spring Quarter. Five recitations each week. Mr. Bohannan.

This course is not open to students who have credit for Mathematics 205-206.

***822. Non-Euclidian Geometry.** Five credit hours. Autumn Quarter. Five recitations each week. Mr. Weaver.

The geometry of Lobatschefskij and other allied geometries.

***841. Finite Groups.** Five credit hours. Spring Quarter. Five recitations each week. Mr. Kuhn.

Substitution groups, abstract groups, finite linear and collineation groups. Text: Miller, Blichfeldt, and Dickson's Theory and Applications of Finite Groups.

This course is not open to students who have credit for Mathematics 211-212.

851. Introduction to Higher Algebra. Five credit hours. Autumn Quarter. Five lectures or recitations each week.

An introduction to the various branches of modern higher algebra and their relations to geometry, based on Bocher's text.

* Not given in 1924-1925.

852. Algebraic Invariants. Five credit hours. Winter Quarter. Five lectures or recitations each week. Prerequisite, Mathematics 851 or equivalent.

A study of the invariants of algebraic forms and systems of forms both in one set of variables and in cogredient sets. Dickson's text will be used during part of the course.

853. Differential Invariants. Five credit hours. Spring Quarter. Five lectures or recitations each week. Prerequisites, Mathematics 601 and 852 or equivalent.

A course in the theory of invariants of differential forms with applications to differential geometry, and a brief introduction to tensor analysis and the theory of relativity.

861. Fourier's Series and Spherical Harmonics. Five credit hours. Autumn Quarter. Five recitations each week. Prerequisites, Mathematics 601 or 165 and physics. Mr. Bohannon.

The solution of certain partial differential equations of physics in terms of normal forms: Fourier's integrals; curvilinear coordinates.

This course is not open to students who have credit for Mathematics 203.

***891. Mathematical Theory of Statistics.** Three credit hours. Spring Quarter. Three recitations each week. Prerequisite, Mathematics 691 or 181. Mr. Morris.

The application of the theory of probability to statistical problems; simple and restricted sampling; errors in statistical constants; partial correlation, etc.

This course is not open to students who have credit for Mathematics 209-210.

MECHANICAL ENGINEERING

Office, 244 Robinson Laboratory

PROFESSORS MAGRUDER, MARQUIS, NORMAN, AND JUDD, ASSISTANT

PROFESSORS A. I. BROWN AND BUCHER, MR. STINSON,
MR. JACKLIN, MR. MOFFAT

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in mathematics, physics, and mechanics in addition to any prerequisites stated in the description of the courses.

603. Steam Engineering. Five credit hours. Autumn Quarter. Five recitations each week. Concurrent, Mechanics 601 and Metallurgy 651. Mr. Marquis, Mr. Bucher, Mr. Beitler.

The continuation of Mechanical Engineering 403.

This course is not open to students who have credit for Mechanical Engineering 103.

* Not given in 1924-1925.

604. Steam Engineering. Five credit hours. Winter Quarter. Five recitations each week. Prerequisites, Mechanical Engineering 603, Mechanics 601, and Metallurgy 651; concurrent, Mechanics 602. Mr. Marquis, Mr. Bucher, Mr. Beitler.

The continuation of Mechanical Engineering 603.

This course is not open to students who have credit for Mechanical Engineering 104.

605. Heating and Ventilating. Four credit hours. Spring Quarter. Four recitations each week. Prerequisites, Mechanical Engineering 604 and Mechanics 602. Mr. Brown.

A descriptive and analytical study of the apparatus and machinery and of the layouts used in the heating and ventilating of buildings.

This course is not open to students who have credit for Mechanical Engineering 551 and 572.

****605. Heating and Ventilating.** Three credit hours. Autumn Quarter. Three recitations each week.

See Mechanical Engineering 605 above.

614. Mechanism. Four credit hours. Autumn Quarter. Four recitations each week. Mr. Stinson, Mr. Moffat.

A descriptive and analytical study of kinematics, mechanism, and mechanical movements.

This course is not open to students who have credit for Mechanical Engineering 114 or 101.

616. Mechanism Drawing. Two credit hours. Winter Quarter. Two three-hour laboratory periods each week. Prerequisite or concurrent, Mechanical Engineering 614. Mr. Stinson, Mr. Moffat.

Drawing-board practice in laying out mechanisms and mechanical movements.

This course is not open to students who have credit for Mechanical Engineering 116.

625. Gas Engines and Producers. Three credit hours. Spring Quarter. Three recitations each week. Prerequisites, Mechanical Engineering 604 and 614; concurrent, Mechanics 603. Mr. Magruder.

A study of gas and oil engines and gas producers as used for power purposes.

This course is not open to students who have credit for Mechanical Engineering 125.

627. Materials of Engineering. Three credit hours. Spring Quarter. Three recitations each week. Prerequisites, Mechanics 602 and Civil Engineering 611; concurrent, Mechanics 603. Mr. Moffat.

639. Practical Experience in a Mechanical Engineering Plant. Five credit hours. Ten weeks during the twelfth Quarter and before beginning the work of the fourth year. Prerequisites, Mechanical Engineering 605, 625, 627, and 665. Mr. Magruder.

** Given only in 1924-1925.

To be obtained in a power plant, drawing office, or engineering works or office. This course is to cover a more advanced grade of work than Mechanical Engineering 439.

The student shall present a satisfactory report upon the work done. This report shall include a discussion of the student's observations on the human, industrial, and engineering aspects of the work with which he was connected, on the systems, methods, and processes of manufacture, and on other observed data worthy of record. The occupation, the work done, and the report shall be subject to approval. If a student has had twelve months, or more, of satisfactory practical experience, he may be permitted to substitute a report upon the work so done for the above requirements. In case a student is unable to obtain an opportunity to get such practical experience as will fulfill the above requirements, he may be permitted to substitute ten credit-hours of approved Quarter-courses for the same. This requirement shall first go into effect with the class graduating in 1927.

664. Mechanical Engineering Laboratory. Three credit hours. Winter Quarter. One six-hour laboratory period each week. Prerequisite, Mechanical Engineering 603; concurrent, Mechanical Engineering 604 and Mechanics 602. Mr. Bucher, Mr. Moffat, Mr. Beitler.

The calibration of pressure gages and indicator springs; steam-engine indicator practice; testing of oils and the materials of construction.

This course is not open to students who have credit for Mechanical Engineering 164.

665. Mechanical Engineering Laboratory. Three credit hours. Spring Quarter. One six-hour laboratory period each week. Prerequisites, Mechanical Engineering 664 and 604; concurrent, Mechanical Engineering 625 and Mechanics 603. Mr. Bucher, Mr. Moffat, Mr. Beitler.

Valve setting, moisture determination in steam, gas calorimetry, measurements of the flow of water by means of orifices, nozzles, weirs, and the venturimeter, and the use of absorption dynamometers.

This course is not open to students who have credit for Mechanical Engineering 664.

701. Automotive Engineering. Three credit hours. Autumn Quarter. Three recitations each week. Prerequisites, Mechanical Engineering 625 and 664. Mr. Jacklin.

A detailed study of the automobile and other automotive machinery, both descriptive and analytical.

702-703. Automotive Engineering. Three credit hours. Winter and Spring Quarters. One recitation and one four-hour laboratory period each week. Prerequisite, Mechanical Engineering 701. Mr. Jacklin.

***711-712. Industrial Engineering.** Three credit hours. Autumn and Winter Quarters. Three recitations each week. Prerequisite, Mechanical Engineering 604.

Studies in industrial and productive engineering.

713. Industrial Engineering. Three credit hours. Spring Quarter. Three lectures each week.

A series of lectures on the history of industrialism, art appreciation, personnel psychology, public health and sanitation, and certain other subjects.

* Not given in 1924-1925.

***715. Air-Compressing and Refrigerating Machinery.** Three credit hours. Autumn Quarter. Three recitations each week. Prerequisites, Mechanical Engineering 604 and Mechanics 603. Mr. Magruder.

A descriptive and analytical study of air-compressing and compressed-air-using machinery and appliances, of systems of refrigeration and their machinery.

727. Machine Design. Five credit hours. Autumn Quarter. Five recitations each week. Prerequisites, Metallurgy 651, Mechanics 603, Mechanical Engineering 627 and 604, and Mechanical Engineering 614. Mr. Norman.

A detailed course of study based upon mechanics and the materials of construction applied to the design and construction of machinery.

This course is not open to students who have credit for Mechanical Engineering 127.

728. Machine Design. Five credit hours. Winter Quarter. Three recitations and two three-hour laboratory periods each week. Prerequisite, Mechanical Engineering 727. Mr. Norman, Mr. Stinson.

The continuation of Mechanical Engineering 727.

This course is not open to students who have credit for Mechanical Engineering 144.

****729. Applied Thermodynamics.** Three credit hours. Winter Quarter. Three recitations each week. Prerequisites, Mechanical Engineering 604 or 104 and 625. Mr. Magruder.

A study of the application of the principles of thermodynamics to air compressors and refrigerating machinery.

This course is not open to students who have credit for Mechanical Engineering 129.

742. Hydraulic Machinery. Three credit hours. One Quarter. Winter and Spring. Three recitations each week. Prerequisites, Mechanics 603 and Mechanical Engineering 604. Mr. Judd.

A study of pumping machinery.

Students who purpose taking Mechanical Engineering 750 in the Spring Quarter should take Mechanical Engineering 742 in the Winter Quarter.

This course is not open to students who have credit for Mechanical Engineering 142.

744. Machine Design. Five credit hours. Spring Quarter. Three recitations and two three-hour laboratory periods each week. Prerequisite, Mechanical Engineering 728. Mr. Norman, Mr. Stinson.

The continuation of Mechanical Engineering 728.

This course is not open to students who have credit for Mechanical Engineering 144.

***746. Steam Turbines.** Three credit hours. Winter Quarter. Three recitations each week. Prerequisites, Mechanical Engineering 606 and 779. Mr. Marquis.

* Not given in 1924-1925.

** Given only in 1924-1925.

A study of the generation of power by steam turbines, including auxiliary machinery.

This course is not open to students who have credit for Mechanical Engineering 146.

****746. Steam Turbines.** Three credit hours. Spring Quarter. Three recitations each week. Prerequisites, Mechanical Engineering 609 and 780. Mr. Marquis.

A study of the generation of power by steam turbines, including auxiliary machinery.

This course is not open to students who have credit for Mechanical Engineering 146.

747. Special Design. Three credit hours. Spring Quarter. Three recitations each week, or the equivalent in drawing-board work. Prerequisite, Mechanical Engineering 728; concurrent, Mechanical Engineering 744. Mr. Norman.

A special course in the design of some machine for a group of advanced students desiring to specialize along this line.

748. Thesis Work. Three or more credit hours. Winter and Spring Quarters. Two or more four-hour laboratory periods each week. Prerequisites, Mechanical Engineering 604, 625, 627, or 727. Mr. Magruder, Mr. Marquis, Mr. Norman, Mr. Judd, Mr. Brown.

An original and special investigation or design based upon the work of the courses.

This course is not open to students who have credit for Mechanical Engineering 148.

750. Hydraulic Power. Four credit hours. Spring Quarter. Two recitations and one four-hour laboratory period each week. Prerequisite, Mechanical Engineering 780. Mr. Judd, Mr. Beitler.

A study of hydraulic turbines and the generation of hydraulic power, including a study of the dynamics of jets and the testing of impulse and reaction turbines.

This course is not open to students who have credit for Mechanical Engineering 150.

779-780-781. Mechanical Engineering Laboratory. Three credit hours. Autumn, Winter, Spring Quarters. One six-hour laboratory period each week. Prerequisites, Mechanics 603 and Mechanical Engineering 609, 664, 625. Mr. Marquis, Mr. Judd, Mr. Brown, Mr. Bucher, Mr. Jacklin.

Tests of steam engines; steam boilers; gas and oil engines; gas producers; air compressors; injectors and pulsometers; centrifugal, rotary and power pumps; hydraulic rams, impulse and turbine water wheels; fans and blowers; steam turbines.

This course is not open to students who have credit for Mechanical Engineering 179 and 190.

793. Mechanical Engineering Laboratory. Three credit hours. Spring Quarter. One six-hour laboratory period each week. Prerequisite,

**** Given only in 1924-1925.**

site, Mechanical Engineering 780. Mr. Marquis, Mr. Judd, Mr. Brown, Mr. Jacklin.

An advanced course in special laboratory work to be arranged for groups of five or more students.

FOR GRADUATES

Prerequisite for Graduate Work: Graduate work in this department requires as general prerequisites, collegiate courses in mechanics, strength of materials, steam engines, and a knowledge of the fundamentals of hydraulics.

For major work a candidate must hold a baccalaureate degree in Mechanical Engineering.

801-802-803. Research Work. Five to ten credit hours. Autumn, Winter, Spring Quarters. Library, conference, and laboratory work. Time to be arranged with the instructor. Prerequisite, the permission of the instructor in charge. Mr. Magruder, Mr. Marquis, Mr. Norman, Mr. Judd, Mr. Brown.

Research work in gas enginery and gas producers and materials of construction is under the supervision of Mr. Magruder; in steam engineering and fuel testing, under Mr. Marquis; in machine design, under Mr. Norman; in applied hydraulics and the flow of fluids, under Mr. Judd; in heating and ventilating, under Mr. Brown.

805-806-807. Gas Power and Design. Two to five credit hours. Autumn, Winter, Spring Quarters. Library, conference, and drawing-board work. Prerequisites, courses in gas engines, automotive engineering, thermodynamics, and machine design. Mr. Magruder.

811-812-813. Gas Power and Laboratory Work. Two to six credit hours. Autumn, Winter, Spring Quarters. One to three four-hour periods each week. Prerequisites, courses in gas engines, automotive engineering, thermodynamics, and machine design; concurrent, Mechanical Engineering 805-806-807. Mr. Magruder.

This course must be taken in groups of at least two and preferably three students.

815-816-817. Steam Power Plants Economics and Design. Three to five credit hours. Autumn, Winter, Spring Quarters. Library, conference and drawing-board work. Prerequisites, courses in power plants, steam engines, turbines, and boilers, and power-plant design. Mr. Marquis.

MECHANICS

Office, 219 Lord Hall

PROFESSORS BOYD AND CODDINGTON, ASSISTANT PROFESSOR OTT

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: An acceptable course in calculus in addition to any prerequisites stated in the description of the courses.

601. Statics. Five credit hours. One Quarter. Autumn, Winter, Spring. Five recitations each week. Mr. Boyd, Mr. Coddington, Mr. Ott.

This course is not open to students who have credit for Mechanics 101.

602. Strength of Materials. Five credit hours. One Quarter. Autumn, Winter, Spring. Four recitations and one two-hour laboratory period each week. Prerequisite, Mechanics 601. Mr. Boyd, Mr. Coddington, Mr. Ott.

This course is not open to students who have credit for Mechanics 102.

603. Strength of Materials, Kinetics and Hydraulics. Five credit hours. One Quarter. Winter and Spring. Five recitations each week. Prerequisite, Mechanics 602. Mr. Boyd, Mr. Coddington, Mr. Ott.

This course is not open to students who have credit for Mechanics 102.

604. Strength of Materials. Three credit hours. Winter Quarter. Three recitations each week. Prerequisite, Mechanics 601. Mr. Boyd.

This course is not open to students who have credit for Mechanics 104.

FOR GRADUATES

Prerequisite for Graduate Work: Graduate work in this department requires as general prerequisites, collegiate courses in differential and integral calculus, differential equations, and a year of general physics.

801. Advanced Theoretical Mechanics. Three credit hours. Autumn Quarter. Three recitations each week. Prerequisites, Mechanics 602 and differential equations. Mr. Coddington, Mr. Boyd.

802. Advanced Theoretical Mechanics. Three credit hours. Winter Quarter. Three recitations each week. Prerequisite, Mechanics 801. Mr. Coddington, Mr. Boyd.

803. Advanced Theoretical Mechanics. Three credit hours. Spring Quarter. Three recitations each week. Prerequisite, Mechanics 802. Mr. Coddington, Mr. Boyd.

NOTE—Mechanics 601, 602, and 603 are identical with Mechanics 101 and 102.
Mechanics 801, 802, and 803 are identical with Mechanics 201 and 203.
Mechanics 604 is nearly the same as Mechanics 104.

METALLURGY

Office, 100 Lord Hall

PROFESSOR DEMOREST, ASSISTANT PROFESSORS MUELLER AND LORD

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Acceptable courses in physics and metallurgy in addition to any prerequisites stated in the description of the courses. Courses 610, 620, and 665 require also a course in descriptive mineralogy.

601. Fuels and Fuel Testing. Five credit hours. Autumn Quarter. Three lectures or recitations and two three-hour laboratory periods each week. Mr. Demorest, Mr. Lord.

Lectures, recitations, and problem work on solid, liquid, and gaseous fuels, their use, preparation, and efficiencies and the thermo-chemistry of combustion. Laboratory work on the analysis of fuels and determination of their heating values.

This course is not open to students who have credit for Metallurgy 117 and 112.

605. Iron and Steel and Elementary Metallography. Five credit hours. Winter Quarter. Three lectures or recitations and two three-hour laboratory periods each week. Prerequisite, Metallurgy 651 or 601. Mr. Demorest, Mr. Lord.

Lectures and problem work on the manufacture and properties of iron and steel and laboratory work in elementary metallography and pyrometry.

This course is not open to students who have credit for Metallurgy 117.

610. Non-Ferrous Metallurgy. Five credit hours. Spring Quarter. Five recitations each week. Prerequisites, Metallurgy 601 and 605. Mr. Mueller.

Lectures, recitations, and problem work on the metallurgy and properties of non-ferrous metals, with special attention to the principles of igneous concentration of the precious metals and study of hydro-metallurgical and electro-metallurgical processes of the present day.

This course is not open to students who have credit for Metallurgy 110.

620. Principles of Ore Dressing. Five credit hours. One Quarter. Autumn and Winter. Three lectures or recitations and two three-hour laboratory periods each week. Mr. Mueller.

Lectures, recitations, and laboratory work on the principles of ore dressing, reclamation of minerals and metals, and coal washing.

This course is not open to students who have credit for Metallurgy 113.

650. Pyrometry. Two credit hours. Autumn Quarter. One lecture or recitation and one three-hour laboratory period each week. Mr. Demorest, Mr. Lord.

Lectures, laboratory, and problem work on the calibration and use of resistance, thermo-electric, optical, and total radiation pyrometers.

This course is not open to students who have credit for Metallurgy 125.

651. Fuels. Three credit hours. One Quarter. Autumn and Winter. Three lectures or recitations each week. Mr. Demorest, Mr. Mueller, Mr. Lord.

Lectures, recitations, and problem work on solid, liquid, and gaseous fuels, their use, preparation, and efficiencies and the thermo-chemistry of combustion.

This course is not open to students who have credit for Metallurgy 117.

652. Gas Testing and Calorimetry. One credit hour. Autumn Quarter. One three-hour laboratory period each week. Concurrent, Metallurgy 651. Mr. Demorest, Mr. Lord.

Laboratory work and problems on the analysis of flue and fuel gases.

This course is not open to students who have credit for Metallurgy 131.

655. Technical Gas and Fuel Analysis. Three credit hours. Winter Quarter. One lecture or recitation and two three-hour laboratory periods each week. Mr. Demorest, Mr. Lord.

Lecture, laboratory, and problem work on the analysis of coal, fuel, and flue gas, and mine gases and the determination of the heating values of solid, liquid, and gaseous fuels.

This course is not open to students who have credit for Metallurgy 112.

665. General Metallurgy. Five credit hours. Spring Quarter. Five lectures or recitations each week. Prerequisite, Metallurgy 601 or 651. Mr. Mueller.

Lectures, recitations, and problem work on the metallurgy of iron, steel, copper, lead, zinc, gold, silver, etc., including the principles of igneous, hydro-metallurgical and electro-metallurgical processes for recovery and refining of the common metals.

This course is not open to students who have credit for Metallurgy 119 and 110.

701. Advanced Metallography. Four credit hours. Autumn Quarter. Two lectures or recitations and two three-hour laboratory periods each week. Prerequisite, Metallurgy 605. Mr. Demorest, Mr. Lord.

The microscopic examination and micro-photography of normal samples of irons, steels, brasses, with special attention to faults and sources of weakness.

This course is not open to students who have credit for Metallurgy 133.

702. Heat Treatment and Special Steels. Three credit hours. Winter Quarter. One lecture or recitation and two three-hour laboratory periods each week. Prerequisite, Metallurgy 701. Mr. Demorest, Mr. Lord.

Experiments in and microscopic study of normalizing, annealing, quenching, tempering, case-hardening, and working of steels with special attention to alloy steels.

This course is not open to students who have credit for Metallurgy 134.

705. Metallurgical Construction. Four credit hours. Winter Quarter. Two lectures or recitations and two three-hour laboratory periods each week. Prerequisites, Metallurgy 601 or 651, 605, 720, 610 or 655. Mr. Mueller.

Lectures, recitations, and drawing-room practice on the principles, practice, and design of concentrators and coal-washing plants.

This course is not open to students who have credit for Metallurgy 127.

706. Metallurgical Construction. Four credit hours. Spring Quarter. Two lectures or recitations and two three-hour laboratory periods each week. Prerequisite, Metallurgy 705. Mr. Demorest, Mr. Mueller.

Option: Continuation of Metallurgy 705 with special reference to operation, control, costs, and handling of materials; or lectures, recitations, and drawing-room practice on the principles, practice, and design of metallurgical furnaces and plants with special reference to operation, control, costs, and handling of materials.

This course is not open to students who have credit for Metallurgy 128.

710. Metallurgical Investigations. Three credit hours. Winter Quarter. One recitation or lecture and two three-hour laboratory periods each week. Prerequisites, Metallurgy 701, 720, 610, or 665. Mr. Demorest, Mr. Mueller.

The class is divided into groups for investigation along the lines of their special interests as follows:

- (a) The Properties of Metals and Alloys.
- (b) Production and Refining of Metals.
- (c) Ore Dressing and Coal Washing.
- (d) Artificial Gas and Coal Distillation Processes.

All investigations are under close direction of instructors.

711. Metallurgical Investigations. Five credit hours. Spring Quarter. Two lectures or recitations and two three-hour laboratory periods each week. Prerequisite, Metallurgy 710. Mr. Demorest, Mr. Mueller.
A continuation of Metallurgy 710.

720. Ore Dressing. Three credit hours. Autumn Quarter. Two lectures or recitations and one three-hour laboratory period each week. Prerequisite, Metallurgy 620. Mr. Mueller.

Lectures and laboratory work in the design of flow sheets and concentration practice for ores and coal washing.

725. Thesis. Five or six credit hours. Spring Quarter. Prerequisite, Metallurgy 710. Mr. Demorest, Mr. Mueller.

Each student is required to select a subject for investigation, with approval of instructor, and to develop methods of research for his subject and carry it to completion.

MINE ENGINEERING

Office, 200 Lord Hall

PROFESSOR NOLD

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Acceptable training in mine engineering in addition to any prerequisites stated in the description of the courses.

601. Prospecting and Preliminary Operations. Five credit hours. Spring Quarter. Five recitations each week.

Prospecting, boring, use of explosives, shaft sinking, and tunneling.

This course is not open to students who have credit for Mine Engineering 122.

701. Development and Methods of Mining. Three credit hours. Autumn Quarter. Three recitations each week. Prerequisite, Mine Engineering 601. Mr. Nold.

Development, location of openings, methods of mining, supporting excavations, etc.

This course is not open to students who have credit for Mine Engineering 123.

702. Mine Operations. Five credit hours. Winter Quarter. Five recitations each week. Prerequisites, Mine Engineering 701, Electrical Engineering 630 and 635. Mr. Nold.

Drainage, haulage, hoisting, ventilation, illumination, mine gases, and explosions.

This course is not open to students who have credit for Mine Engineering 124.

703. Mine Examinations and Reports. Five credit hours. Spring Quarter. Five lectures each week. Prerequisites, Mine Engineering 702 and Geology 605 or equivalent. Mr. Nold.

Mine examinations, estimation of ore reserves, valuation, reports, organization, administration and determination of costs.

This course is not open to students who have credit for Mine Engineering 126.

711. Mine Design. Five credit hours. Winter Quarter. Three recitations and two three-hour laboratory periods each week. Concurrent, Mine Engineering 702. Mr. Nold.

Design of mining plants. The student is given certain data relative to an actual or hypothetical mine, and he designs the plant lay-out and details a building.

This course is not open to students who have credit for Mine Engineering 127.

712. Mine Design. Five credit hours. Spring Quarter. One recitation and three four-hour laboratory periods each week. Prerequisite, Mine Engineering 711. Mr. Nold.

A continuation of the problem assigned in Mine Engineering 711. The design of mine structures and buildings. Specification writing and estimating of costs.

This course is not open to students who have credit for Mine Engineering 128.

740. Thesis. Two credit hours. Winter Quarter. Mine Engineering, fourth year. Mr. Nold.

741. Thesis. Five credit hours. Spring Quarter. Mine Engineering, fourth year. Mr. Nold.

This is a continuation of Mine Engineering 740.

750. Mine Investigations. Three to five credit hours. One Quarter. Autumn, Winter, Spring. Prerequisite or concurrent, Mine Engineering 702. Mr. Nold.

A study and investigation of some phase of mining or mine operations.

760. Principles of Mining. Three credit hours. Autumn Quarter. Three recitations each week. Mr. Nold.

Recitations and lectures on the principles of prospecting and mining.

This course is not open to students who have credit for Mine Engineering 115.

FOR GRADUATES

Prerequisite for Graduate Work: Students desiring to undertake advanced work in this department should have a thorough working knowledge of chemistry, physics, and mechanics.

For major work a candidate must hold a baccalaureate degree in Mine Engineering.

801-802-803. Mining Investigations. Three to five credit hours. Autumn, Winter, Spring Quarters. Prerequisite, the permission of the instructor in charge. Mr. Nold.

Library, conference, laboratory, and field work on some phase of mining or mine operations.

This course is not open to students who have credit for Mine Engineering 201-202.

MINERALOGY

Office, 115 Lord Hall

PROFESSOR McCaughey

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Acceptable courses in mineralogy and blowpipe analysis in addition to any prerequisites stated in the description of the courses. Course 611 requires also an acceptable course in geology and elementary petrography; 621, a college course in physics covering light.

605. Thermochemical Mineralogy. Three credit hours, Autumn Quarter. Four credit hours, Spring Quarter. Three or four lectures each week. Prerequisite, Chemistry 681-682-683. Mr. McCaughey.

Thermal properties of minerals, their formation and transformation in silicate mixtures.

This course is not open to students who have credit for Mineralogy 105.

611. Elementary Microscopic Petrography. Four credit hours. Spring Quarter. Two lectures and two three-hour laboratory periods each week. Mr. McCaughey.

Instruction and practice in the use of the petrographic microscope in the identification and study of minerals and rocks in thin section.

This course is not open to students who have credit for Mineralogy 111.

621. Microscopic Mineralogy. Five credit hours. Autumn Quarter. Two lectures and three three-hour laboratory periods each week. Mr. McCaughey.

The use of a polarizing microscope in the identification of minerals in fine powder and thin section. Determination of the optical constants of minerals and crystallized substances with the polarizing microscope.

This course is not open to students who have credit for Mineralogy 121.

631. Mineralogical Investigations. Five credit hours. Winter and Spring Quarters. Library, conference, and advanced laboratory work. Prerequisites, Mineralogy 621 or 611. Mr. McCaughey.

(a) **Advanced Crystallography.** Study of the thirty-two crystal groups and their representative minerals. Laboratory practice with the two-circle goniometer in the measurement of crystals and drawing and projection of these crystals.

(b) **Microscopic Petrography.** Study and investigation of igneous, metamorphic, and sedimentary rocks in thin section.

(c) **Soil Mineralogy.** Mineralogical investigation of loose rock, such as soils, sand, and clays.

(d) **Applied Microscopic Mineralogy.** Application of the principles of microscopic mineralogy to the determination of melting and transformation temperature of minerals; microscopic study of refractories, ceramic products and glasses.

PATHOLOGY

Office, Hamilton Hall

PROFESSORS SCOTT AND SPOHR, MR. VAN BUSKIRK, MR. REEL,
MISS OLIVER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Permission of the instructor in addition to any prerequisites stated in the description of the courses.

601. General Pathology. Three credit hours. Winter Quarter. One lecture and six laboratory hours each week. Prerequisite, Anatomy

624. Mr. Scott, Miss Oliver.

Pathology of inflammatory, regenerative, and retrogressive lesions.

This course is not open to students who have credit for Pathology 109.

602. Special Pathology. Five credit hours. Spring Quarter. Two lectures and nine laboratory hours each week. Prerequisite, Pathology

601. Mr. Scott, Miss Oliver.

Pathology of the special organs and tumors.

This course is not open to students who have credit for Pathology 109.

603. Clinical Pathology. Three credit hours. Autumn Quarter. One lecture and four laboratory hours each week. Mr. Spohr.

Pathology of the blood; complement fixation; anaphylaxis; vaccines; urine; feces; stomach contents; spinal fluid, and the various exudates.

This course is not open to students who have credit for Pathology 119.

604. Clinical Pathology. Three credit hours. Winter Quarter. One lecture and four laboratory hours each week. Mr. Spohr.

This is a continuation of Pathology 603.

This course is not open to students who have credit for Pathology 120.

605. **Surgical Pathology.** Two credit hours. Spring Quarter. One lecture and two laboratory hours each week. Mr. Reel.

A course correlating the symptomatology with the operative specimens.

This course is not open to students who have credit for Pathology 103.

606. **Medical Pathology.** Two credit hours. Spring Quarter. One lecture and two laboratory hours each week. Mr. Van Buskirk.

A course correlating the symptomatology with the post-mortem pathology.

This course is not open to students who have credit for Pathology 104.

607. **Post-Mortem Demonstration.** One credit hour. One Quarter. Autumn, Winter, Spring. Mr. Scott, Mr. Van Buskirk.

This course is not open to students who have credit for Pathology 107.

608-609-610. **Advanced Pathology.** Three to five credit hours. Autumn, Winter, Spring Quarters. One lecture and four to six laboratory hours each week. Prerequisites, Pathology 601-602 and Bacteriology 641-642. Mr. Scott, Miss Oliver.

Autopsy and microscopical technique.

This course is not open to students who have credit for Pathology 127-128.

611-612-613. **Advanced Special Pathology.** Three to five credit hours. Autumn, Winter, Spring Quarters. One lecture and four or six laboratory hours each week. Prerequisites, Pathology 601-602 and Bacteriology 641-642. Mr. Scott, Mr. Reel, Miss Oliver.

Histology and experimental pathology of special organs and tissues.

This course is not open to students who have credit for Pathology 133-134.

614-615. **Experimental Pathology.** Three to five credit hours. Winter and Spring Quarters. One lecture and four or six laboratory hours each week. Prerequisites, Pathology 601-602 and Bacteriology 641-642. Mr. Spohr.

Experimental infections and immunity as applied to medicine.

This course is not open to students who have credit for Pathology 139-140.

616-617-618. **Advanced Clinical Pathology.** Three credit hours. Autumn, Winter, Spring Quarters. One lecture and four laboratory hours each week. Prerequisite, Pathology 603-604. Mr. Spohr.

Study of materials collected in the hospital wards and out-patient department.

This course is not open to students who have credit for Pathology 143.

619-620-621. **Neuropathology.** One credit hour. Autumn, Winter, Spring Quarters. One lecture and two laboratory hours each week. Prerequisite, Pathology 601. Miss Oliver.

Including the gross and microscopic lesions of the nervous system.

This course is not open to students who have credit for Pathology 129-130.

PHILOSOPHY

Offices, 321 and 300 University Hall

PROFESSORS LEIGHTON AND SABINE, ASSISTANT PROFESSORS CHANDLER
AND AVEY, MR. D. L. EVANS

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: In addition to any prerequisites stated in the description of the courses the prerequisites for courses in this group are as follows: Course 601 requires an acceptable course in the introduction to philosophy or elementary ethics; 602, 605, 606, 610, 628, 625, 626, and 652 require an acceptable course in the introduction to philosophy; 603, acceptable courses in the introduction to philosophy and elementary ethics; 653 and 656, acceptable courses in the introduction to philosophy and elementary ethics, and the permission of the instructor; 661, acceptable courses in the introduction to philosophy and logic; 662, acceptable courses in the introduction to philosophy and logic, and the permission of the instructor.

Students are advised to consult with the instructor in reference to details concerning prerequisites.

Courses bearing numbers 601 to 650 are historical; courses bearing numbers 651 to 700 are systematic.

601. History of Ancient and Mediaeval Philosophy. Five credit hours. Autumn Quarter. Mr. Sabine.

A review of the most important contributions to philosophical thought from the dawn of history to the end of the Middle Ages. Ancient Oriental ideas are briefly touched upon. Most of the time is devoted to Greek philosophy. The problems of mediaeval thought are given some attention.

A natural continuation of this course will be found in Philosophy 602.

This course is not open to students who have credit for Philosophy 107.

602. History of Modern Philosophy. Five credit hours. Winter Quarter. Prerequisite, Philosophy 601. Mr. Sabine.

A review of the most important contributions to philosophical thought from the Renaissance to the end of the nineteenth century.

A natural continuation of this course will be found in Philosophy 603.

This course is not open to students who have credit for Philosophy 108.

603. Contemporary Philosophy. Five credit hours. Spring Quarter. Prerequisites, two of the following: Philosophy 601, 602, 656, or 106, 107, 108. Mr. Chandler.

An account and critical estimate of the chief formative influences in the reflective life of the present time. Intended for students of literature, science, and social movements, as well as for students desiring a continuation of Philosophy 601-602.

This course is not open to students who have credit for Philosophy 141 or 142.

605. Origins of Our Moral Ideas. Five credit hours. Winter Quarter. Mr. Leighton.

A historical and critical consideration of the ideals of human life and ethical principles both individual and social, contributed to our culture by ancient Greece, Christianity, modern science, and modern humanism. The object of the course is to arrive at a systematic evaluation of the valid factors in an ethical philosophy of life.

This course is not open to students who have credit for Philosophy 111 or 112.

606. American Philosophy. Three credit hours. Autumn Quarter. Mr. Evans.

A survey of the chief philosophical standpoints which have entered into the constitution of the American mind since colonial times; the life and works of the thinkers whose theories are considered.

610. Origins of Christian Thought. Three credit hours. Spring Quarter. Prerequisite, Philosophy 601 or 107. Mr. Avey.

A historical inquiry into the content and meaning of the psychological, ethical, and metaphysical teaching of the New Testament; followed by an inquiry into the development of Christian thought up to the formation of the Nicene Creed, with especial reference to the influence of Greek philosophy thereon.

This course is not open to students who have credit for Philosophy 120.

623. Plato. Three credit hours. Autumn Quarter. Prerequisite, three Quarters in philosophy, including Philosophy 601 or 107. Mr. Chandler.

Selected dialogues of Plato will be studied in Jowett's translation with reference to their permanent significance for philosophy, literature, and politics.

This course is not open to students who have credit for Philosophy 123.

624. Aristotle and Plotinus. Three credit hours. Winter Quarter. Prerequisite, Philosophy 623. Mr. Chandler.

Selections from the writings of Aristotle and Plotinus will be studied with reference to their permanent significance for philosophy.

This course is not open to students who have credit for Philosophy 124.

625. Representative Pre-Kantian Philosophers. Three credit hours. Spring Quarter. Prerequisite, Philosophy 602 or 108. Mr. Evans.

A few representative works of classic thinkers of the period from Bacon and Descartes to Kant will be selected for intensive study.

This course is not open to students who have credit for Philosophy 125.

***626. Representative Post-Kantian Philosophers.** Three credit hours. Winter Quarter. Prerequisite, Philosophy 602 or 108. Mr. Avey.

A few representative works of classic thinkers of the period from Kant to Spencer will be selected for intensive study.

* Not given in 1924-1925.

This course is not open to students who have credit for Philosophy 126.

***652. Philosophy of Science.** Three credit hours. Winter Quarter. Prerequisite, Philosophy 602 or 108; also three Quarters of college science. Mr. Avey.

An examination of the fundamental motives, assumptions, and methods of the natural and social sciences, with consideration of their influence on philosophical theories.

This course is not open to students who have credit for Philosophy 117 or 118.

653. Philosophy of Religion. Three credit hours. Spring Quarter. Prerequisites, not less than two of the following: Philosophy 601, 602, 610, or 107-108. Mr. Leighton.

The psychical and social nature of religion; the leading ideas of the great world-religions; a systematic examination of the fundamental religious conceptions—the idea of God in relation to the idea of the world, the idea of man, and the problem of human destiny.

This course is not open to students who have credit for Philosophy 119.

656. Social Ethics. Three credit hours. Spring Quarter. Prerequisite, one of the following: Philosophy 601, 602. Mr. Leighton.

A consideration, in the light of philosophy, of the humanistic and social values and aims of the chief forms of civilized life—industrial and economic activities, the state, education, culture, and religion. Emphasis is laid on the social function of education as being the most important instrument of individual welfare and social progress.

This course is not open to students who have credit for Philosophy 106 or 406.

660. Minor Problems. Two to five credit hours. Autumn, Winter, Spring Quarters. All instructors.

Investigation of minor problems in the history of philosophy or systematic philosophy.

661. Metaphysics of Knowledge and Nature. Three credit hours. Autumn Quarter. Prerequisites, two of the following: Philosophy 601, 602, 603, or 107, 108; also two Quarters in psychology and one in natural science. Mr. Avey.

A systematic discussion, for graduate students and advanced undergraduates, of the following subjects: the nature of knowledge and its place in reality, the general structure of reality, and the philosophy of nature.

A natural continuation of this course will be found in Philosophy 662.

This course is not open to students who have credit for Philosophy 121.

662. Metaphysics of Personality and Values. Three credit hours. Winter Quarter. Prerequisites, two of the following: Philosophy 601, 602, 603, or 107, 108; also two Quarters in psychology. Philosophy 661 is desirable, but not required. Mr. Avey.

* Not given in 1924-1925.

A systematic discussion, for graduate students and advanced undergraduates, of the following subjects: the nature of the self, the mind-body problem, the problem of values, the problems of freedom and immortality, and the problem of the nature and value of existence as a whole.

This course is not open to students who have credit for Philosophy 122.

FOR GRADUATES

Prerequisite for Graduate Work: The courses named below presuppose good foundation courses either in psychology, logic and ethics or in the history of philosophy, and, in some cases, in all of these subjects. Prospective students are likewise strongly recommended to prepare for graduate work in this department by taking related courses in other departments. Psychology is regarded as related to all courses in philosophy. The following are suggested as related courses in other departments: for students of logic and metaphysics, mathematics, and natural sciences, especially general and theoretical physics, general and historical chemistry, and evolution (Zoology 409-410); for students of ethics and the philosophy of religion, sociology and history; for students of the history of philosophy, European history, and the history of Greek, German, English, and French literatures. As a qualification for the study of philosophy as a graduate "major" the student must previously have completed the equivalent of at least eighteen Quarter-credit hours in philosophy and psychology. In case of students who are taking a major in ethics, two Quarters' work in the principles of sociology may be accepted in partial fulfillment of the above requirement. Within the general field of philosophy graduate "majors" and "minors" may be taken in the following special groups: logic and metaphysics, ethics, the philosophy of religion, and the history of philosophy (ancient, medieval, and modern).

801. Seminary in Systematic Philosophy. Three credit hours. Autumn Quarter. Mr. Sabine.

Topic for 1924, Kant.

802. Seminary in Systematic Philosophy. Three credit hours. Winter Quarter. Mr. Leighton, Mr. Sabine.

Topic for 1925, the Logic of Hegel and the Metaphysics of Bosanquet.

803. Seminary in Systematic Philosophy. Three credit hours. Spring Quarter. Mr. Leighton.

Topic for 1925, the contemporary philosophy of nature.

809-810-811. Research. Autumn, Winter, Spring Quarters. Three to ten credit hours in each Quarter. Mr. Leighton, Mr. Sabine, Mr. Chandler, Mr. Avey.

Properly qualified students may pursue research in any Quarter under the guidance of the department, with suitable credit.

***815. Seminary in Social and Political Philosophy.**

816-817. Seminary in Social and Political Philosophy. Three credit hours. Winter and Spring Quarters. Mr. Sabine.

A critical consideration of the conceptions of the leading philosophers of western civilization on the ideals and principles of social organization.

***820. Philosophy of History.** Three credit hours. Winter Quarter. Prerequisites, any two of the following: Philosophy 601, 602, 603, 605,

* Not given in 1924-1925.

656, 662, or 107, 108, 111; also at least four Quarters of college history, of which at least two must be in European history. Mr. Leighton.

An inquiry into the place of the historical sciences in the system of knowledge and an examination of the criteria and reality of human progress in the light of ethics and metaphysics.

This course is not open to students who have credit for Philosophy 145 or 146 or 665.

PHYSICAL EDUCATION

MEN

Office, The Gymnasium

PROFESSORS ST. JOHN, WILCE, CASTLEMAN, AND NICHOLS,
ASSISTANT PROFESSOR TRAUTMAN, MR. DUFFEE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in physiology in addition to any prerequisites stated in the description of the courses. Course 683 requires also a fundamental course in psychology; 685, a fundamental course in public health; 691, a fundamental course in anatomy; and 692, a fundamental course in chemistry.

***682. Organization and Administration of Physical Education.** Five credit hours. Winter Quarter. Five lectures each week. Prerequisite, Physical Education 684. Mr. St. John, Miss Clark, Mr. Trautman.

A consideration of the problems of organization for physical education in elementary and secondary schools and colleges, including standards and methods in administration of interscholastic, intercollegiate, and intramural athletics. The first eight lectures will deal with problems common to both men and women's work. Thereafter, the women's classes will be conducted separately, with emphasis on problems peculiar to this field. The personnel of a department, athletic and gymnastic facilities, and construction, purchase and care of equipment, keeping of records and reports, handling of finances, schedule making, publicity, insignia and awards, managerial systems, scholastic and athletic eligibility, and professionalism, will be included in the problems discussed.

683. History and Principles of Physical Education. Five credit hours. Winter Quarter. Five lectures each week. Mr. Wilce.

An historical survey of physical education beginning with that of Greece and including contemporary developments and a consideration of the biological and educational aspects of physical education, with special reference to its place in education.

This course is not open to students who have credit for Physical Education 110 or 136 or 681.

***685. Prevention and Care of Injuries, Including Training of Athletes.** Three credit hours. Autumn Quarter. Three lectures each week. Mr. Nichols, Mr. Castleman.

A consideration of the methods of prevention and care of injuries, especially emphasizing dangers and conditions arising in connection with physical education, and the condition of athletes for athletic contests.

* Not given in 1924-1925.

This course is not open to students who have credit for Physical Education 125 and 126.

691. Kinesiology. Three credit hours. Autumn Quarter. Three lectures each week. Miss Jones, Mr. Duffee.

Lectures and recitations dealing with the anatomical mechanism of movements. The purpose of the course is to acquaint the student with means of analyzing movements intelligently and prescribing programs of gymnastics, sports, and dancing for developmental or corrective purposes.

***692. Hygiene and School Health Problems.** Three credit hours. Winter Quarter. Three lectures each week. Miss Clark, Mr. Wilce, Mr. Nichols.

A consideration of methods, courses of study and material used in health instruction in schools and colleges, together with discussions of medical inspection, symptoms and control of the common school diseases, problems relating to the health environment of the school child and the teacher.

WOMEN

Office, Pomerene Hall

PROFESSOR CLARK, ASSISTANT PROFESSOR JONES

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: A fundamental course in physiology in addition to any prerequisites stated in the description of the courses. Course 671 requires also courses in anatomy and physical education; 682, a fundamental course in physical education; 683, a fundamental course in psychology; 691, a course in anatomy; and 692, a course in chemistry.

***671. Therapeutic Gymnastics Advanced (Women).** Three credit hours. Autumn Quarter. Two lectures and three laboratory periods each week. Miss Clark.

Lectures and discussions of therapeutic gymnastics in elementary and secondary schools and colleges. Opportunity will be given for observation and practice in college groups and clinics. Part of the course will be devoted to lectures and discussions of physical diagnosis with the object of familiarizing the student with the common ailments and symptoms.

***682. Organization and Administration of Physical Education.** Five credit hours. Winter Quarter. Five lectures each week. Prerequisite, Physical Education 684. Mr. St. John, Miss Clark, Mr. Trautman.

A consideration of the problems of organization for physical education in elementary and secondary schools and colleges, including standards and methods in administration of interscholastic, intercollegiate, and intramural athletics. The first eight lectures will deal with problems common to both men and women's work. Thereafter, the women's classes will be conducted separately, with emphasis on problems peculiar to this field. The personnel of a department, athletic and gymnastic facilities, and construction, purchase and care of equipment, keeping of records and reports, handling of finances, schedule making, publicity, insignia and awards, managerial systems, scholastic and athletic eligibility, and professionalism, will be included in the problems discussed.

* Not given in 1924-1925.

683. History and Principles of Physical Education. Five credit hours. Winter Quarter. Five lectures each week. Mr. Wilce.

An historical survey of physical education beginning with that of Greece and including contemporary development and a consideration of the biological and educational aspects of physical education, with special reference to its place in education.

This course is not open to students who have credit for Physical Education 110 or 136 or 681.

691. Kinesiology. Three credit hours. Autumn Quarter. Three lectures each week. Miss Jones, Mr. Duffee.

Lectures and recitations dealing with the anatomical mechanism of movements. The purpose of the course is to acquaint the student with means of analyzing movements intelligently and prescribing programs of gymnastics, sports, and dancing for developmental or corrective purposes.

***692. Hygiene and School Health Problems.** Three credit hours. Winter Quarter. Three lectures each week. Miss Clark, Mr. Wilce, Mr. Nichols.

A consideration of methods, courses of study and material used in health instruction in schools and colleges, together with discussion of medical inspection, symptoms and control of the common school diseases, problems relating to the health environment of the school child and the teacher.

PHYSICS

Office, 107 Physics Building

PROFESSORS COLE, EARHART, BLAKE, AND ALPHEUS W. SMITH, ASSISTANT
PROFESSORS HEIL AND ALVA W. SMITH

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in physics. Courses 607, 608, 609, and 610 require also an acceptable course in calculus.

Students should consult with the instructor concerning details for prerequisite requirements.

602. Advanced Laboratory: Mechanics and Heat. Three credit hours. One Quarter. Autumn and Spring. Two three-hour laboratory periods each week. Mr. Heil.

This course is not open to students who have credit for Physics 123.

603. Advanced Laboratory: Radiation. Three credit hours. Winter Quarter. Two three-hour laboratory periods each week. Mr. Heil.
An advanced laboratory course in exact measurements of indices of refraction, wave length, dispersion, polarization, absorption, spectrum analysis, etc.

This course is not open to students who have credit for Physics 124.

604. Advanced Laboratory: Electrical Measurements. Three credit hours. One Quarter. Autumn and Spring. Two three-hour laboratory periods each week. Mr. Alva Smith.

* Not given in 1924-1925.

An advanced laboratory course in exact measurements of currents, resistances and electromotive forces, magnetic permeability, capacity and inductance, use of oscillograph in the study of alternating and transient currents.

This course is not open to students who have credit for Physics 124 and 139.

605. Advanced Laboratory: Ionization and Radioactivity. Three credit hours. Winter Quarter. Two three-hour laboratory periods each week. Mr. Heil.

An advanced laboratory course in the use of electroscope and electrometer for exact measurements of currents in gases, discharge of electricity from radioactive materials, absorption of radiation by matter, characteristic curves of three-electrode tubes, etc.

607. Advanced Light. Four credit hours. Spring Quarter. Three recitations and one two-hour laboratory period each week. Mr. Cole.

Lenses, systems of lenses, cardinal points, defects of images and their correction, optical instruments, spectroscopy, plane gratings, concave gratings, the ultra-violet, the infra-red, diffraction, interference, interferometers, photometry, spectrophotometer, polarization, optical rotation, displacement currents, Hertzian waves, dispersion theory, anomalous dispersion, rest-strahlen, X-rays and their spectra, K and L series, Quantum theory, Zeeman and Stark effects, atom models, Bohr theory.

This course is not open to students who have credit for Physics 143.

608. Advanced Electricity. Four credit hours. Winter Quarter. Four lectures and recitations each week. Mr. Earhart.

An introductory course in the mathematical theory of electricity and magnetism.

This course is not open to students who have credit for Physics 144.

609. Molecular Physics and Heat. Four credit hours. Autumn Quarter. Four lectures and recitations each week. Mr. Earhart.

A study of the kinetic theory of gases, capillarity, osmosis, and related topics.

This course is not open to students who have credit for Physics 147.

610. Conduction of Electricity through Gases and Radioactivity. Four credit hours. Spring Quarter. Four classroom hours each week. Mr. Heil.

An introductory course on the passage of electricity through gases and evacuated tubes, ionic velocities, photo-electricity, determination of the elementary charge, discharge of electricity from incandescent solids, radioactive properties of matter, etc.

This course is not open to students who have credit for Physics 148.

FOR GRADUATES

Prerequisite for Graduate Work: The graduate courses in physics all presuppose a good course in college physics extending over at least a year and including laboratory work. In addition, the theoretical courses have a working knowledge of calculus as a prerequisite and the laboratory courses presuppose a year's work in the laboratory of a more advanced character than that included in the college course in general physics. A fair reading knowledge of German and French is highly desirable.

801. Advanced Theory of Light. Three credit hours. Autumn Quarter. Prerequisite, Physics 607 or its equivalent. Mr. Cole.

This course deals with fundamental principles and their application in recent experimental research. It includes such topics as propagation of waves in crystals,

elliptical polarization, spectral series, broadening of spectrum lines. Doppler effect, Zeeman effect and new types of interferometer.

This course is not open to students who have credit for Physics 169.

802. Advanced Theory of Light. Three credit hours. Winter Quarter. Mr. Cole.

This is a continuation of Physics 801 dealing with such topics as recent work in infra-red, residual rays, focal isolation, X-ray wave lengths, spectro photometry, physical nature of light, group velocity, Maxwell theory, Hertz's verification, boundary conditions, theories of dispersion, relative motion of matter and ether, Einstein theory.

This course is not open to students who have credit for Physics 170.

***803. Thermo-dynamics.** Three credit hours. Autumn Quarter. Prerequisite, Physics 609 or its equivalent. Mr. Alpheus W. Smith.

This course deals with the fundamental principles of thermo-dynamics and their application to such topics as osmotic pressure, electrolytic conduction, diluted and concentrated solutions, the phase rule, chemical equilibrium, metastability of matter, Nernst's heat theorem and the modern theories of specific heats.

This course is not open to students who have credit for Physics 205

***804. Thermo-dynamics.** Three credit hours. Winter Quarter. Mr. Alpheus W. Smith.

This is a continuation of Physics 803.

This course is not open to students who have credit for Physics 206.

805. Theory of Electricity and Magnetism. Three credit hours. Autumn Quarter. Prerequisite, Physics 608 or its equivalent. Mr. Alpheus W. Smith.

This course deals with the electromagnetic theory as originally developed by Maxwell. It includes also a consideration of the modern theories of electricity and magnetism. It is essentially a mathematical course.

806. Theory of Electricity and Magnetism. Three credit hours. Winter Quarter. Mr. Alpheus W. Smith.

This is a continuation of Physics 805.

This course is not open to students who have credit for Physics 207.

807. Theory of Electricity and Magnetism. Three credit hours. Spring Quarter. Mr. Alpheus W. Smith.

This is a continuation of Physics 806.

This course is not open to students who have credit for Physics 208.

809. Theory of Oscillations. Three credit hours. Autumn Quarter. Three lectures and recitations each week. Prerequisite, Physics 608 or equivalent. Mr. Blake.

The general theory of small oscillations will be developed and applied both to acoustical and electrical vibrations. The loaded line will be studied, the "telegraph equation" developed, and the methods of eliminating distortions in telephone circuits given. Both damped wave and continuous wave radiators will be studied, an expression for the radiation from a wireless antenna developed and compared with experiment and the theory of the thermionic tube as an oscillator and as an amplifier presented and applied. Power transmission circuits will be studied by means of hyperbolic functions.

This course is not open to students who have credit for Physics 211.

* Not given in 1924-1925.

810. Theory of Oscillations. Three credit hours. Winter Quarter. Mr. Blake.

This is a continuation of Physics 809.

This course is not open to students who have credit for Physics 212.

811. Theory of Oscillations. Three credit hours. Spring Quarter. Mr. Blake.

This is a continuation of Physics 810.

This course is not open to students who have credit for Physics 212.

812. Seminary in Physics. One credit hour. Autumn, Winter, Spring Quarters. Prerequisite, two years of college physics. A maximum of three credit hours may be secured in this course. Mr. Cole.

The work in this course consists of reviews of important recent research in physics and reports upon the same before the department instructors at their weekly journal meeting.

This course is not open to students who have two hours credit in Physics 145-146.

***813. Electronic Theory and Atomic and Molecular Structure.** Three credit hours. Autumn Quarter. Three lectures and recitations each week. Prerequisite, Physics 610 or equivalent. Mr. Blake.

The evidence for a nuclear atom will be given and the Rutherford-Bohr theory of the nuclear atom will be developed. The quantum theory will be developed and applied to problems of atomic and molecular structures, especially to the fine line structure of spectroscopy, including X-ray spectroscopy. The quantum theory will also be applied to the determination of specific heats and to molecular rotations in the infra-red. Both the chemical or static atom and the physical or dynamic atom will be studied and compared. This course is strongly recommended to students of fundamental physical and chemical theories of matter.

This course is not open to students who have credit for Physics 217.

***814. Electronic Theory and Atomic and Molecular Structure.** Three credit hours. Spring Quarter. Mr. Blake.

This is a continuation of Physics 813.

This course is not open to students who have credit for Physics 218.

***815. Electronic Theory and Atomic and Molecular Structure.** Three credit hours. Spring Quarter. Mr. Blake.

This is a continuation of Physics 814.

This course is not open to students who have credit for Physics 218.

821. Conduction of Electricity through Gases. Three credit hours. Spring Quarter. Prerequisites, Physics 609, 610, or equivalent. Mr. Earhart.

A seminary course covering important researches on the electronic theory as applied to gases.

This course is not open to students who have credit for Physics 213.

***822. Radioactivity.** Three credit hours. Spring Quarter. Prerequisite, Physics 610 or equivalent. Mr. Heil.

A course of graduate lectures and reports covering in detail some of the more

* Not given in 1924-1925.

striking experiments of the last twenty years on the properties of radioactive materials and their transformations, the theory of exact measurements of small currents in gases, etc.

This course is not open to students who have credit for Physics 214.

830. Research Laboratory. Three credit hours. Autumn Quarter. Prerequisite, two years of laboratory physics. Mr. Cole, Mr. Earhart, Mr. Blake, Mr. Alpheus Smith, Mr. Heil, Mr. Alva Smith.

831. Research Laboratory. Three credit hours. Winter Quarter. Prerequisite, two years of laboratory physics. Mr. Cole, Mr. Earhart, Mr. Blake, Mr. Alpheus Smith, Mr. Heil, Mr. Alva Smith.

832. Research Laboratory. Three credit hours. Spring Quarter. Prerequisite, two years of laboratory physics. Mr. Cole, Mr. Earhart, Mr. Blake, Mr. Alpheus Smith, Mr. Heil, Mr. Alva Smith.

PHYSIOLOGICAL CHEMISTRY, PHARMACOLOGY, AND MATERIA MEDICA

Office, Hamilton Hall

PROFESSOR SMITH, ASSISTANT PROFESSOR KREMERS

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in general chemistry, qualitative analysis, and organic chemistry in addition to any prerequisites stated in the description of the courses.

601. Physiological Chemistry. Five credit hours. Autumn Quarter. Two lectures, one quiz, and six laboratory hours each week. Mr. Smith and assistants.

The chemistry of carbohydrates, lipins, and proteins.

This course is not open to students who have credit for Physiology 123.

602. Physiological Chemistry. Five credit hours. Winter Quarter. Two lectures, one quiz, and nine laboratory hours each week. Prerequisite, Physiological Chemistry 601. Mr. Smith and assistants.

The chemistry of digestion, metabolism and excretion.

This course is not open to students who have credit for Physiology 123.

603. Quantitative Methods of Blood and Urine Analysis. Three credit hours. One Quarter. Autumn and Winter. One lecture and six laboratory hours each week. Prerequisites, Physiological Chemistry 602. Mr. Smith.

Determination of important constituents of the blood and urine.

604. Evaluation of Diets. Two credit hours. Spring Quarter. Two lectures or two quizzes each week. Prerequisites, Physiology 601, 602, 603, and Physiological Chemistry 601, 602. Mr. Smith.

This course is designed to familiarize the students with food values.

605. Pharmacology. Five credit hours. Spring Quarter. Two lectures, one quiz, and six laboratory hours each week. Prerequisites, Physiology 604, 605, 606, and Physiological Chemistry 601, 602. Mr. Smith and assistants.

This course treats of the modification of the normal physiological processes of the body by the presence of the more common drugs used in medicine. A review of prescription writing is given together with a brief laboratory course in toxicology.

This course is not open to students who have credit for Physiology 130.

***607. Methods of Biologic Drug Assay.** Two credit hours. Spring Quarter. One lecture and three laboratory hours each week. Prerequisite, Pharmacology 605. Mr. Smith.

This course includes consideration of the methods in common use for the biological standardization of drugs.

***608. Toxicology.** Three credit hours. Winter Quarter. One lecture and six laboratory hours each week. Prerequisite, Pharmacology 605 or equivalent. Mr. Smith.

An advanced course dealing with the effects and detection of poisons, including food preservatives.

FOR GRADUATES

801. Research in Physiological Chemistry. Five or ten credit hours. Autumn Quarter. Investigational work with conferences and assigned reading. Prerequisites, Physiological Chemistry 601, 602, 603. Mr. Smith.

The subject matter of this course will vary with the individual needs of the student.

802. Research in Physiological Chemistry. Five or ten credit hours. Winter Quarter. Mr. Smith.

See description of Physiological Chemistry 801.

803. Research in Physiological Chemistry. Five or ten credit hours. Spring Quarter. Mr. Smith.

See description of Physiological Chemistry 801.

804-805-806. Vegetable Materia Medica. Three credit hours. Autumn, Winter, Spring Quarters. One conference hour and two three-hour laboratory periods each week. Given biennially. Prerequisite, organic and physical chemistry.

A critical application of plant chemistry to the study of the production, biochemistry and utilization of medicinal plants. Presentation will be by the "case" method, with special emphasis on important U. S. P. drugs.

* Not given in 1924-1925.

810. Research in Materia Medica. Three to ten credit hours. Hours to be arranged. Course 804 or 807 should either precede or accompany this election.

Problems assigned will have as their objectives either the investigation of plant products of medicinal interest, or the synthesis of chemicals desired for pharmacological study. Close cooperation will be maintained with the pharmacological laboratory.

PHYSIOLOGY

Office, Hamilton Hall

PROFESSORS HOSKINS AND BLEILE, ASSISTANT PROFESSORS SEYMOUR AND McPEEK, MR. E. P. DURRANT, MR. HITCHCOCK, MR. LEE, MR. CHARLTON, MR. R. R. DURANT

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in physiology or equivalent biological training, in addition to any prerequisites stated in the description of the courses.

601. Advanced Physiology. Five credit hours. Autumn Quarter. Two lecture or quiz and nine laboratory hours each week. Mr. Hoskins, Mr. Seymour, Mr. McPeek, Mr. Durrant, Mr. Hitchcock, Mr. Lee, and assistants.

This course deals with the physiology of the contractile tissues, reflexes, lymph, blood and circulation. This course is based primarily upon individual laboratory work.

This course is not open to students who have credit for Physiology 121-122.

602. Advanced Physiology. Five credit hours. Winter Quarter. Two lecture or quiz and nine laboratory hours each week. Mr. Hoskins, Mr. Seymour, Mr. McPeek, Mr. Durrant, Mr. Hitchcock, Mr. Lee, and assistants.

A study of respiration, digestion, excretion, metabolism, central nervous system, and sense organs, based upon laboratory experiments on frogs, turtles, and mammals.

This course is not open to students who have credit for Physiology 121-122.

603. Advanced Physiology. Two credit hours. Spring Quarter. Two quiz hours each week. Prerequisites, Physiology 601 and 602. Mr. Hoskins, Mr. Seymour, Mr. McPeek, Mr. Charlton.

A didactic review of the subject matter of Physiology 601 and 602.

This course is not open to students who have credit for Physiology 121-122.

604. Advanced Physiology. Six credit hours. Autumn Quarter. Three lecture or recitation hours and nine laboratory hours each week. Mr. Hoskins, Mr. Seymour, Mr. McPeek, Mr. Durrant, Mr. Charlton, Mr. Hitchcock, Mr. Lee, and assistants.

This course deals with the physiology of the contractile tissues, reflexes, lymph, blood and circulation. The course is based upon animal experimentation by the stu-

dents, supplemented by demonstrations by the instructors. The bearing of the data obtained upon clinical phenomena is considered.

This course is not open to students who have credit for Physiology 121 or 601.

605. Advanced Physiology. Six credit hours. Winter Quarter. Three lecture or recitation hours and nine laboratory hours each week. Mr. Hoskins, Mr. Seymour, Mr. McPeck, Mr. Durrant, Mr. Charlton, Mr. Lee, and assistants.

This is a continuation of Physiology 604, dealing with respiration, digestion, excretion, metabolism, the central nervous system and sense organs.

This course is not open to students who have credit for Physiology 121-122 or 602.

606. Advanced Physiology. Two credit hours. Spring Quarter. Two lecture or quiz hours each week. Prerequisites, Physiology 604 and 605. Mr. Hoskins, Mr. Seymour, Mr. McPeck, Mr. Charlton.

This course is a didactic review of the subject matter covered in Physiology 604 and 605.

This course is not open to students who have credit for Physiology 603.

608. Physiological Laboratory. Five credit hours. Autumn Quarter. Two conference and nine laboratory hours each week. Prerequisites, Physiology 601 and 602 or equivalent training. Mr. Bleile and assistants.

An exclusively laboratory course in advanced and specialized physiology of metabolism, blood, digestion, foods, etc., as the student may elect.

This course should not be elected without previous conference with the instructor in charge.

609. Physiological Laboratory. Five credit hours. Winter Quarter. Two conference and nine laboratory hours each week. Prerequisites, Physiology 601 and 602 or equivalent training. Mr. Bleile and assistants.

See description under Physiology 608.

This course should not be elected without previous conference with the instructor in charge.

610. Physiological Laboratory. Five credit hours. Spring Quarter. Two conference and nine laboratory hours each week. Prerequisites, Physiology 601 and 602 or equivalent training. Mr. Bleile and assistants.

See description under Physiology 608.

This course should not be elected without previous conference with the instructor in charge.

611. Physiological Laboratory. Five credit hours. Autumn Quarter. Two conference and nine laboratory hours each week. Prerequisites, Physiology 601 and 602 or equivalent training. Mr. Hoskins, Mr. Seymour, and assistants.

An exclusively laboratory course in advanced and specialized physiology of circulation, respiration, neuromuscular phenomena, endocrinology, etc., as the student may elect.

This course should not be elected without previous conference with the instructor in charge.

612. Physiological Laboratory. Five credit hours. Winter Quarter. Two conference and nine laboratory hours each week. Prerequisites, Physiology 601 and 602 or equivalent training. Mr. Hoskins, Mr. Seymour, and assistants.

See description under Physiology 611.

This course should not be elected without previous conference with the instructor in charge.

613. Physiological Laboratory. Five credit hours. Spring Quarter. Two conference and nine laboratory hours each week. Prerequisites, Physiology 601 and 602 or equivalent training. Mr. Hoskins, Mr. Seymour, and assistants.

See description under Physiology 611.

This course should not be elected without previous conference with the instructor in charge.

FOR GRADUATES

801. Research Physiology: Minor. Five credit hours. Autumn Quarter. Investigational work with conferences and assigned reading. Prerequisites, Physiology 601 and 602 or equivalent in biological training. Mr. Hoskins, Mr. Bleile.

The subject matter covered in this course will be adapted to the needs of individual students.

802. Research Physiology: Minor. Five credit hours. Winter Quarter.

For description see Physiology 801.

803. Research Physiology: Minor. Five credit hours. Spring Quarter.

For description see Physiology 801.

804. Research Physiology: Major. Ten or fifteen credit hours. Autumn Quarter. Prerequisites, Physiology 601 and 602 or equivalent biological training. Mr. Hoskins, Mr. Bleile.

Original investigation, assigned reading, and conferences. Preparation of thesis.

805. Research Physiology: Major. Ten or fifteen credit hours. Winter Quarter.

For description see Physiology 804.

806. Research Physiology: Major. Ten or fifteen credit hours. Spring Quarter.

For description see Physiology 804.

POLITICAL ECONOMY

(See Economics and Sociology)

POLITICAL SCIENCE

Office, 206 Hayes Hall

PROFESSORS SPENCER AND COKER, MR. POLLOCK, MR. CALDERWOOD

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in political science in addition to any prerequisites stated in the description of the courses.

604. State Legislative and Administrative Problems. Three credit hours. Spring Quarter. Three meetings each week. Mr. Coker.

The scope of state powers and activities; problems and methods of state government in the fields of finance, business and industrial regulation, and legislative procedure; the executive budget and administrative reorganization.

This course is not open to students who have credit for Political Science 132.

607. Municipal Government. Five credit hours. Autumn Quarter. Five meetings each week.

A comparative study of modern municipalities in the United States and the principal countries of Europe; their social significance; their governmental structure; their relation to the state; the experience with government by council, mayor, commission, and manager; methods of popular participation. Lectures, investigations, and reports on particular cities.

This course is not open to students who have credit for Political Science 106.

608. Municipal Functions. Three credit hours. Winter Quarter. Three meetings each week. Prerequisite, Political Science 607.

A study of the activities of modern municipalities: the organization, methods employed, policies and problems in the fields of finance; health and sanitation; police and fire protection; education; city planning; housing; public utilities; charities and corrections; recreation.

This course is not open to students who have credit for Political Science 130.

611. Introduction to Jurisprudence. Five credit hours. Autumn Quarter. Five meetings each week. Mr. Spencer.

An introductory study of legal concepts. An attempt is made both to give the prospective law student an analytical and historical guide into his subject, and to give those who do not intend to pursue the study of law an idea of its significance in social organization, and its relation to political and economic science.

This course is not open to students who have credit for Political Science 125.

612. International Law. Three credit hours. Winter Quarter. Three meetings each week. Mr. Spencer.

A study of the principles of international law in their growth and present status, with particular attention to unsettled points, and problems raised by the World War.

This course is not open to students who have credit for Political Science 126.

613. Contemporary International Politics. Five credit hours. Spring Quarter. Five meetings each week. Mr. Spencer.

Methods and ideals of diplomacy; current problems in international relations, such as the reorganization of Europe, Pan-Americanism, and the Far East; tendencies toward administrative, judicial, and legislative world-organization.

This course is not open to students who have credit for Political Science 113-114.

616. American Constitutional Law. Three credit hours. Autumn Quarter. Three meetings each week. Mr. Coker.

A study of leading constitutional principles in the United States as interpreted by the courts. Special studies will be made of such topics as the following: the adoption and amendment of constitutions with special attention to the later amendments to the Federal Constitution; the judicial power to declare laws unconstitutional; citizenship; private rights, with particular reference to freedom of speech and the press; the powers of Congress, with particular attention to taxation and the regulation of commerce; war powers; police power of the states; political privileges. Designed for students who desire a non-technical knowledge of the more important federal and state constitutional principles in the United States.

619. History of Political Theories. Three credit hours. Winter Quarter. Three meetings each week. Mr. Coker.

The development of leading ideas in politics from the time of the Greeks to the end of the eighteenth century.

This course is not open to students who have credit for Political Science 115.

620. Recent Political Theories. Three credit hours. Spring Quarter. Three meetings each week. Mr. Coker.

A study of leading political ideas in Europe and America since the beginning of the nineteenth century, with special reference to recent and contemporary doctrines and movements. It will embody a study of the political writings of important authors and of characteristic ideas of groups indicated by the terms liberalism, internationalism, and pluralism; and an analysis of current theories as to the relation of the state to property and labor, including the political programs of recent socialism, syndicalism, and guild socialism.

This course is not open to students who have credit for Political Science 118.

631-632. Methods of Governmental Research. Two credit hours. Autumn and Winter Quarters. Two meetings each week.

Direction and training of students in methods of gathering and presenting data on governmental problems. Lectures, assigned readings, special investigations, field work under the direction of the Bureau of Governmental Research and the Ohio Institute of Public Efficiency.

This course is not open to students who have credit for Political Science 151-152.

FOR GRADUATES

Prerequisite for Graduate Work: Graduate work in this department presupposes a foundation laid in college courses in the historical and social sciences. As a qualification for the study of political science as a graduate "major," the student must have completed previously the equivalent of six three-hour Quarter-courses, chosen among the subjects of political science, history, and economics. This must include three Quarters' work in political science.

HISTORICAL CONFERENCE: In addition to the formal courses indicated below, a monthly conference is held, composed of the instructors and graduate students in the departments of History and Political Science. The discussions in this conference cover a wide range of topics of general interest to students and investigators in these fields.

801-802-803. Research in Political Science. Three to five credit hours. Autumn, Winter, Spring Quarters. Prerequisite, six Quarter-courses in political science.

This course presents an opportunity for advanced research in political science, in such portion of the field as may be agreed upon with the individual student. It is offered in every Quarter, and with any of the members of the department in residence.

POULTRY HUSBANDRY

Office, Judging Pavilion

PROFESSOR DAKAN

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in poultry husbandry in addition to any prerequisites stated in the description of the courses.

601. Poultry Feeding and Housing. Three credit hours. Winter Quarter. Two recitations and one two-hour laboratory period each week. Mr. Dakan.

The principles and practices of poultry feeding, planning of poultry houses, and a study of poultry farms.

603. Marketing Poultry Products. Three credit hours. Autumn Quarter. Two recitations and one two-hour laboratory period each week. Also reporting twice daily for two weeks including Sunday. Mr. Dakan.

This course deals with the commercial practices in handling eggs and poultry, crate fattening, killing and dressing poultry for market, cooperative poultry associations, and the marketing of poultry and eggs.

605. Poultry Farm Management. Three credit hours. Spring Quarter. Three recitation periods each week. Prerequisites, Poultry Husbandry 601, 602 and 603. Mr. Dakan.

The principles of farm management as applied to the poultry farm; selection of the farm; use of poultry farm score card; farm layout and arrangement of buildings; study of farm records; and advertising. As a final problem, each student will work out a plan for the management of a poultry enterprise that seems most adaptable to his personal needs. The course will require several excursions to nearby poultry farms in addition to recitation periods. This course is a summary of all poultry courses and should be taken during the senior year and preceded or accompanied by all other courses in poultry husbandry.

701. Special Problems in Poultry Husbandry. Three to fifteen credit hours, taken in units of three to five hours each Quarter for one or more Quarters. Autumn, Winter, Spring Quarters.

This course is limited to advanced students only, by arrangement with the professor in charge. Each student will be required to make an exhaustive study of some particular phase of poultry husbandry and write a thesis of his study and research. The work must comprise in part some original investigation by the student.

PRINCIPLES AND PRACTICE OF EDUCATION

Office, 103 Hayes Hall

PROFESSORS BODE, BRIM, AND THAYER, ASSISTANT PROFESSOR
LANDSITTEL

GENERAL PRINCIPLES

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fifteen Quarter hours in educational subjects, philosophy, or psychology. Courses 660 and 661 require fundamental courses in physics and chemistry.

Students should consult the instructor for details concerning prerequisites.

601. Moral Ideals in Education. Four credit hours. Winter Quarter.

A consideration of types of moral ideals, of the relation of moral values to school subjects, and of the question of direct and systematic moral instruction in the schools.

This course is not open to students who have credit for Principles of Education 350.

***605. Cultural and Vocational Ideals in Education.** Four credit hours. Spring Quarter.

A study of cultural and vocational aims, with reference to their historic background and contemporary opinion, and in their significance for a democratic society.

This course is not open to students who have credit for Principles of Education 352.

620. Conceptions of Mind in Educational Theory. Three credit hours. Autumn Quarter. Mr. Bode.

A study of the doctrines of mind that have exercised a determining influence upon educational theory and practice.

This course is not open to students who have credit for History and Philosophy of Education 103 or Principles of Education 354.

***630. Logical and Ethical Aspects of Education.** Three credit hours. Winter Quarter. Mr. Bode.

An inquiry into the nature of concepts and their function in the process of thinking, and into the problem of moral training in the schools.

This course is not open to students who have credit for History and Philosophy of Education 104.

* Not given in 1924-1925.

640. Modern Tendencies in Education. Three credit hours. Spring Quarter. Mr. Bode.

A discussion of current doctrines and controversies, in the light of their historic background and their philosophical implications.

This course is not open to students who have credit for Principles of Education 112 or 356.

643. The Doctrine of Interest and Apperception. Three credit hours. Winter Quarter.

The role of interest and apperception in modern educational procedure. Reference will be made to theories of Herbart and the Herbartians in so far as they apply to these problems.

645. Social Education. Three credit hours. Spring Quarter. Wide readings, papers, lectures, and discussions. Mr. Lumley.

An examination of educational agencies and processes other than those of the school, which contribute to the enlightenment and socialization of the individual. An analysis of childhood's isolation, the methods of communication and control, the influence of the family, the playgrounds, the industrial organization, the church, and the state.

647. The Concept of Nature and Inner Development in Education. Three credit hours. Winter Quarter.

The psychological and philosophical concepts of nature and inner development as applied to modern educational theory and practice. Reference will be made to the contributions of Pestalozzi and Froebel to these problems.

651-652-653. Minor Problems. Two to four credit hours. Autumn, Winter, Spring Quarters. Mr. Bode.

Investigation of minor problems in the field of principles and practice of education.

By permission of the head of the department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff.

SECONDARY EDUCATION

FOR ADVANCED UNDERGRADUATES AND GRADUATES

610. Supervision of Teaching in Secondary Schools. Three credit hours. Autumn Quarter. Consent of instructor. Mr. Thayer.

The problems involving cooperation between supervisors and teachers. Approved practices in the supervision of classroom work and the evaluation of methods and results.

This course is not open to students who have credit for Principles of Education 119 or 357 or 358 or 611 or 612.

625. Problems of Curriculum Construction in Secondary Education. Five credit hours. Winter Quarter. Mr. Thayer.

A critical study of present curriculum material in relation to school objectives and pupil needs. The former procedure and present tendency in curriculum construction will be evaluated. The most effective type of curriculum, and the function of supervisor and teacher in its construction will be considered.

This course is not open to students who have credit for Principles of Education 362 or 363.

651-652-653. Minor Problems. Two to four credit hours. Autumn, Winter, Spring Quarters. Mr. Bode.

Investigation of minor problems in the field of principles and practice of education.

By permission of the head of the department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff.

660. Methods and Problems of the Physical Sciences. Four credit hours. Autumn Quarter. Mr. Smith.

Students in the College of Education who are majoring in any of the non-biological sciences must secure credit for four hours of work in Principles of Education 660, 661, 364, 365. These courses are elective for other students in the College of Education and for students in the other colleges.

The purposes of this course are: (1) to trace the ideas which have dominated creative thinking in the physical sciences; (2) to discuss the factors which have given direction and impetus to the development of these sciences; (3) to study the subjects and personalities that have had most to do with their development; (4) to give an understanding of the methods by which the outstanding scientific work has been done and the methods by which it must be stimulated in others; (5) to discuss the scope, opportunities, important problems and centers of development in the physical sciences; (6) to interpret the influence of science in education and in civilization; (7) to give a comprehensive picture of the nature, influence, and development of the scientific mind.

*661. Methods and Problems of the Physical Sciences. Four credit hours. Winter Quarter. Mr. Smith.

For description see Principles of Education 660.

ELEMENTARY AND RURAL EDUCATION

FOR ADVANCED UNDERGRADUATES AND GRADUATES

612. Survey of Scientific Investigations in Elementary School Subjects. Three credit hours. Spring Quarter. Three lectures each week. Mr. Brim.

The contributions of scientific research to the teaching of the elementary school subjects. Methods and results will be examined and the implications for schoolroom procedure considered.

This course is not open to students who have credit for Principles of Education 374.

613. Supervision of Elementary School Teaching. Three credit hours. Autumn Quarter. Mr. Brim.

The distinctive function of supervision, the problems involved, the requirements for efficiency in supervision, the methods of diagnosis and evaluation of teaching and learning procedure, ways and means of improving instruction, maintaining teacher morale, and stimulating cooperative work.

This course is not open to students who have credit for Principles of Education 360 or 361.

614. Curriculum Construction in Elementary Education. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Brim.

* Not given in 1924-1925.

A critical study of present curriculum materials in relation to school objectives and pupil needs. The former procedure and present tendency in curriculum construction will be evaluated. The most effective type of curriculum, and function of supervisor, teacher and pupil in its construction will be considered.

615. Experimental Elementary Schools. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Brim.

A study of the attempt to demonstrate and test the different educational theories in elementary schools throughout the country. These schools will be studied and evaluated in relation to principles.

This course is not open to students who have credit for Principles of Education 370.

616. Elementary Teacher Training. Four credit hours. Autumn Quarter. Four lectures each week. Mr. Landsittel.

A study of the function, content and organization of courses of study designed to contribute toward the training of teachers for elementary schools. Standards of organization and training, means of capitalizing subject-matter courses, the interrelations of professional courses, and direction of observation and practice teaching will receive special consideration.

617. Supervision of Rural Elementary Schools. Three credit hours. One Quarter. Autumn and Spring. Three lectures each week. Mr. Brim.

Specific attention will be given to the problems of the supervisor of rural schools. Standards for judging the several activities to be supervised, the analysis and evaluation of the usual procedure, ways and means of improving the teacher's work through conferences, demonstration teaching, directed study of classroom problems, etc., will be discussed.

618. Rural Teacher Training. Five credit hours. One Quarter. Winter and Spring. Mr. Brim.

A course given specifically for those who are responsible for training rural teachers in normal colleges and in county normal schools. Problems in teacher training confronted by members of the class will be carefully considered. Desirable curriculum content, organization of work, and provision for observation and practice teaching will be stressed.

This course is not open to students who have credit for Principles of Education 372.

651-652-653. Minor Problems. Two to four credit hours. Autumn, Winter, Spring Quarters.

Investigation of minor problems in the field of principles and practice of education.

By permission of the head of the department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff.

FOR GRADUATES

Prerequisite for Graduate Work: Students who desire to become candidates for advanced degrees, with a major in the principles of education, must have a total credit equivalent to thirty Quarter hours of work in educational subjects, philosophy or psychology.

802-803-804. Seminary in Educational Theory. Three credit hours. Autumn, Winter, Spring Quarters. Mr. Bode.

811-812-813. Seminary in Secondary Education. Three credit hours. Autumn, Winter, Spring Quarters. Mr. Thayer.

821-822. Seminary in Scientific Education. Three credit hours. Autumn and Winter Quarters. Mr. Smith.

Studies in the history, methods, problems, influence, scope, and future development of the physical sciences. It is adapted to the needs of students specializing in principles of education or in any of the physical sciences.

825-826-827. Seminary in Elementary Education. Three credit hours. Autumn, Winter, Spring Quarters. Mr. Brim, Mr. Landsittel.

The distinctive elements of American culture and the responsibilities they impose upon the agencies of education.

831-832-833. Seminary in Rural Life and Education. Three credit hours. Autumn, Winter, Spring Quarters. Mr. Brim.

851-852-853. Major Research. Three or more credit hours. Autumn, Winter, Spring Quarters. The departmental staff.

Primarily intended for students offering theses for advanced degrees.

By permission of the head of the department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff.

PSYCHOLOGY

Office, 403 University Hall

PROFESSORS ARPS, WEISS, BURTT, AND GODDARD, ASSISTANT PROFESSORS PRESSEY, ROGERS, WILLIAMS, DOLL, TOOPS, AND JOHNSON, MR. ESPER, MRS. PRESSEY

The courses offered in psychology fall into four general groups. The following approximate sequences are suggested for the guidance of students desiring a consistent program giving preparation in one of these fields. It is strongly urged, however, that students contemplating such work consult with the department as early as possible with reference to the arrangement of courses.* This is particularly the case with graduate students. Thus in planning for a Doctor's degree a reading knowledge of French and German should be acquired during the undergraduate period.

I. Normal Psychology:* 601-602-603, 608, 621, 623, 629, 630, 645, 650.

II. Educational Psychology—preparation for psychological work in the schools:* 608, 613, 614, 615, 616, 611, 651, or 652, 650.

III. Abnormal and Clinical Psychology:* 607, 621, 611, 609, 634, 616, 617, 641, 642, 650.

IV. Applied Psychology: 635, 636, 608, 639, 637, 638, 634, 650.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in psychology in addition to any prerequisites stated in the description of the courses. Course 624 requires a fundamental course in physics.

601. Experimental Psychology: Introduction. Three credit hours. Autumn Quarter. One lecture and two laboratory periods each week. Mr. Weiss.

A systematic training course in the psychological methods as applied to the sense fields. Topics: vision; audition; the cutaneous, olfactory, gustatory, kinesthetic, and organic senses.

This course is not open to students who have credit for Psychology 111.

602. Experimental Psychology: Intermediate. Three credit hours. Winter Quarter. One lecture and two laboratory periods each week. Prerequisite, Psychology 601. Mr. Weiss.

This course is a continuation of Psychology 601 and deals with more complex forms of behavior.

This course is not open to students who have credit for Psychology 112.

603. Experimental Psychology: Advanced. Three credit hours. Spring Quarter. Three laboratory periods each week. Prerequisite, Psychology 602. Mr. Weiss.

This course is a continuation of Psychology 602, and will consist of minor experimental problems.

605. Physiological Psychology. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Goddard.

The aim of this course is to give a consistent picture of the physical basis of mind. It uses the important facts of the anatomy and physiology of the central and autonomic nervous systems and the more generally accepted theories of nerve functions and their correlations with mental processes. It is adapted to the needs of medical students and those taking courses in abnormal psychology and the mentally deficient child.

This course is not open to students who have credit for Psychology 149.

606. Advanced Physiological Psychology. Three credit hours. Winter Quarter. Three lectures each week. Prerequisite, Psychology 605 or permission of the instructor. Mr. Goddard.

This course will deal with the larger problems of the dependence of mental phenomena upon physiological processes such as: the emotions and the sympathetic system; temperament and the endocrines; consciousness and the circulation; nerve activity without consciousness; effect of unusual physiological conditions (e. g., produced by fatigue, alcohol, syphilis or other toxins) upon various mental processes.

This course is not open to students who have credit for Psychology 150.

607. Genetic Psychology and Child Study. Five credit hours. Spring Quarter. Five lecture hours each week. Lectures, recitations, and reports. Mr. Williams.

This course is designed to present the facts of mental development in the child and their significance. Topics considered are: individual development, particularly with reference to the development of the nervous system; inheritance of mental traits; innate tendencies, their characteristics, description, and modification; play; mental states, their physiological basis and development with growth and training; moral and religious development; physical development; methods of child study; exceptional children (observation of atypical children in city and state institutions).

This course is not open to students who have credit for Psychology 115-116.

608. Mental and Social Measurements. Three credit hours. Autumn Quarter. Two lecture or recitation hours and one two-hour laboratory period each week. Mr. Toops.

A statistical course for students expecting to conduct investigations in psychology, education, and the social sciences. Methods of measuring central tendencies, variability, and correlation; construction of charts and graphs; interpretations of results in terms of probability. Emphasis will be placed upon computational and shortcut methods.

This course is not open to students who have credit for Psychology 114.

609. The Exceptional Child. Three credit hours. Spring Quarter. Three lecture hours each week. Lectures, reports, clinics, and visits to public institutions. Mr. Doll.

Individual differences among children with respect to mental, physical, and social traits. The social and pedagogical significance of talent and defect. Consideration of gifted children, special ability, special disability, delinquency, speech defect, and conduct disorder. Minor consideration of mental deficiency. Emphasis will be placed upon the psychology of the exceptional child as a foundation for educational classification and treatment.

This course is not open to students who have credit for Psychology 155.

611. The Mentally Deficient Child. Three credit hours. Autumn Quarter. Three lecture hours each week. Lectures, reports, clinics, and visits to public institutions. Mr. Doll.

This course supplements and naturally follows 609. The varieties and grades of mental deficiency, including the backward child of the schools and the distinctly feeble-minded. Consideration of mental deficiency and defect for purposes of educational treatment and social disposition. The psychology of feeble-mindedness; types, degrees, causes, and consequences. Minor consideration of the special pedagogy of backward children.

This course is not open to students who have credit for Psychology 122.

612. Advanced Mental and Social Measurements. Three credit hours. Winter Quarter. Two lecture or recitation hours and one two-hour laboratory period each week. Prerequisite, Psychology 608, or School Administration 613, or Sociology 635-636-637. Mr. Toops.

Construction of criteria, partial correlation, multiple correlation, scoring formulae, weights of tests, distribution of aggregates, reliability coefficients, special cases in correlation; construction of tables and graphs to meet the research needs of individual students.

613. Mental and Educational Tests. Three credit hours. Autumn Quarter. Three lecture hours each week. Lectures, readings, classroom demonstrations, and special reports. Mr. Pressey.

A brief course covering the use of tests of both ability and school work. The course will begin with a discussion of tests in arithmetic, reading and history, and other school subjects, will then take up tests of intelligence and will conclude with a general discussion of the handling of test scores and of the use to be made of these scores in dealing with practical problems.

This course is not open to students who have credit for Psychology 133-134.

***614. Problems of Test Work.** Three credit hours. Spring Quarter. Three lectures each week. Lectures, readings in educational periodicals, discussion. Prerequisite, Psychology 613 or its equivalent, or (by permission of the instructor) extended experience in the use of tests. Mr. Pressey.

Reliability and validity of tests. Interpretation of scores. Statement of results; graphing. Criteria for selecting tests; organization of test work; records; application of test results in dealing with educational problems. The work will be illustrated throughout by use of standard mental and educational tests. Students having data of their own are urged to make use of this material in working out application of the principles discussed.

615. Laboratory in Mental and Educational Tests. Three credit hours. Winter Quarter. Six laboratory hours each week. Prerequisite, Psychology 613. Mrs. Pressey.

Intensive laboratory practice in the use of tests. Also work on the construction of tests and in the practical application of test results to educational problems.

This course is not open to students who have credit for Psychology 133-134.

616. Binet Mental Tests. Two credit hours. Autumn Quarter. Two laboratory periods each week. Lectures, reports, laboratory, demonstrations, and individual testing. Prerequisite or concurrent, Psychology 609 or 611. Mr. Doll and assistants.

Practice on the technique of the Binet-Simon scale for measuring intelligence. Brief historical and descriptive treatment of the Binet scale, followed by intensive training in the practical Binet testing of school children.

This course is not open to students who have credit for Psychology 147-148.

617. Elementary Psychological Clinic. Two credit hours. Winter Quarter. Two laboratory periods each week. Lectures, reports, demonstrations, laboratory and individual testing. Prerequisite, Psychology 616. Mr. Doll and assistants.

Advanced study and application of the Binet-Simon scale for measuring intelligence. Psychology of Binet tests with study of the statistical principles involved in the construction of the scale. Descriptive study of the various modifications of the Binet-Simon scale. Intensive laboratory training in advanced Binet testing, with special emphasis on the diagnostic use of the test and qualitative interpretation of results.

This course is not open to students who have credit for Psychology 147-148.

618. Clinical Mental Tests. Two credit hours. Spring Quarter. Two laboratory periods each week. Lectures, laboratory and individual

* Not given in 1924-1925.

testing. Prerequisite, Psychology 608 or 613. Mr. Doll and assistants.

Descriptive and practical laboratory study of standardized diagnostic mental tests. Intensive laboratory training in the application of mental tests for individual examination, with special reference to tests of proved diagnostic value.

This course is not open to students who have credit for Psychology 147-148.

619. Advanced Psychological Clinic. Two credit hours. Spring Quarter. Two laboratory periods each week. Lectures, reports, laboratory and individual case studies. Prerequisites, Psychology 617 and 618, or permission of the instructor. Mr. Doll and assistants.

Theory and practice of mental diagnosis. Descriptive and practical study of the clinical syllabus and case-taking, including family history, personal history, school history, social history and so on. Combination mental diagnosis based on the application and interpretation of various mental tests for general intelligence, special ability and disability, and so on. Training in the preparation of clinical reports.

This course is not open to students who have credit for Psychology 147-148.

620. Practicum in Mental Diagnosis. Two credit hours. One Quarter. Autumn, Winter, Spring. Assignments equivalent to two laboratory periods each week. Prerequisite, Psychology 619 or permission of the instructor (students are advised to consult instructor before registering). Mr. Doll and assistants.

Applied clinical diagnosis. Students will engage in actual diagnostic service, under the supervision of the instructor. Cases will be studied in the laboratory and in the nearby public schools and institutions. Special training in the diagnosis of borderline, psychopathic and doubtful cases. Advanced training in the preparation of clinical reports.

This course is not open to students who have credit for Psychology 147-148.

621. Social Psychology. Three credit hours. Winter Quarter. Three lecture hours each week. Mr. Arps.

The nature and variety of innate tendencies; the relation of these tendencies to acquired behavior and social control; the development of personality.

This course is not open to students who have credit for Psychology 125.

623. Folk Psychology. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Esper.

A consideration of the psychological factors involved in the various forms of group behavior.

This course is not open to students who have credit for Psychology 126.

624-625. Psychology of Vision. Three credit hours. Winter and Spring Quarters. Three lectures each week. Given biennially. Prerequisite, Psychology 602. Mr. Johnson.

Production, measurement and control of photic stimuli and measurements of the variations in their effectiveness as determined by physical and physiological factors. The work will consist in part of lecture-demonstrations and experiments and in part of a critical study of the reports of original authors. Special attention will be given to the facts and hypotheses of color-vision and to visual problems in industry.

627. Comparative Psychology. Three credit hours. Winter Quarter. Three lectures each week. Mr. Johnson.

A survey of animal behavior from one-celled organisms to the anthropoid apes. The topics studied will include sensation, instinct, learning, and intelligence, with special reference to methods as well as results.

This course is not open to students who have credit for Psychology 119.

628. Advanced Educational Psychology. Three credit hours. Spring Quarter. Three lectures each week. Lectures, readings in monographs and journals, discussions. Mr. Pressey.

An advanced course in educational psychology dealing with certain especially important problems in this field, as control of the learning process, memory and forgetting, the more elaborate types of learning, as in silent reading, transfer of training, fatigue.

629. Advanced Psychology. Five credit hours. Winter Quarter. Five lectures each week. Miss Rogers.

The purpose of this course is to give a larger background to the advanced student of psychology, with respect to the development of psychology as a science, emphasizing the relations of psychology to other disciplines, especially the sciences, and with respect to the evolutions of some of its fundamental concepts, as consciousness and behaviorism.

This course is not open to students who have credit for Psychology 129.

630. Psychology of Feeling and Emotion. Five credit hours. Spring Quarter. Five lectures each week. Prerequisite, Psychology 629. Miss Rogers.

A study of the various theories of feeling and emotion and the fundamental relations of emotion to instincts. The relations between these subjects and social behavior will be emphasized.

This course is not open to students who have credit for Psychology 138.

631. Theory of Intelligence. Three credit hours. Winter Quarter. Three lecture hours each week. Lectures, reports and classroom demonstrations. Mr. Doll.

Nature of intelligence, current and historical concepts. Psychology of intelligence; physical and physiological correlates. Distribution and growth of intelligence. Critical study of the "Intelligence Quotient." Mental age, mental level, mental type, mental function.

633. Psychology of Language. Three credit hours. Winter Quarter. Three lectures each week. Mr. Esper.

This course is designed especially for students of language who wish to become acquainted with the psychological factors in speech, and will deal with the nature of the speech reaction, the development of speech in the child, the types of linguistic categories, and the psychological factors in linguistic change.

634. Criminal and Legal Psychology. Five credit hours. Winter Quarter. Five lectures each week. Mr. Burr.

Psychological factors in the determination of reliability of testimony; the technique of detecting crime and falsehood; responsibility; the relation of crime to mental defect; the prevention of crime through environmental factors and heredity.

This course is not open to students who have credit for Psychology 151-152.

635. Psychology of Advertising. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Burt.

The psychological principles involved in effective advertising, notably attention, memory and action, with the contributory factors of association, feeling, instinct, suggestion, and reasoning.

This course is not open to students who have credit for Psychology 128.

636. Advertising Laboratory. Three credit hours. Winter Quarter. Six laboratory hours each week. Prerequisite, Psychology 635. Mr. Burt.

General and special problems illustrating the application of laboratory methods and the treatment and use of experimental data in the field of advertising.

This course is not open to students who have credit for Psychology 131-132.

637. Industrial Psychology. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Burt.

The application of psychology to problems of industrial learning, adjustment of technical to mental factors, monotony, fatigue, and environmental conditions.

This course is not open to students who have credit for Psychology 127.

638. Industrial and Vocational Psychology Laboratory. Three credit hours each Quarter. Autumn, Winter, Spring Quarters. Two three-hour laboratory periods each week. Prerequisite, permission of the instructor. Mr. Burt, Mr. Toops.

Laboratory work in the application of psychology to industrial and vocational problems, with especial emphasis on the development of mental tests for hiring employees. Practice in the devising and standardizing of occupational tests; obtaining and evaluating production ratings; correlation of ratings and tests; interpretation of results from the standpoint of vocational selection or guidance. A portion of the work of the course is frequently done in local business and industrial plants.

This course is not open to students who have credit for Psychology 135-136.

639. Psychology and Personnel. Three credit hours. Winter Quarter. Three lectures each week. Mr. Burt.

The application of psychology to problems of personnel. Selection and placement of employees by tests of intelligence and special ability. Trade tests, job analysis, and rating scales.

This course is not open to students who have credit for Psychology 127 nor to students who have taken Psychology 637 prior to 1923-1924.

640. Educational and Vocational Guidance. Three credit hours. Winter Quarter. Prerequisite, permission of the instructor. Mr. Toops.

A course dealing with the technique of evaluating psychological and related factors as a basis for making educational and vocational recommendations to individuals. The place of vocational and educational tests, previous record, and personality traits in determination of choice of occupation or course of study.

This course is not open to students who have credit for Psychology 417.

641. Abnormal Psychology. Five credit hours. Winter Quarter. Five lectures each week. Lectures, recitations, and clinics. Mr. Goddard.

The abnormal mental phenomena—viz., disorders of perception, association, memory, affection, judgment, action, volition, and personality, with especial emphasis on their relation to the respective normal phenomena. The grouping of these disorders into the syndromes exhibited in the main types of insanity.

This course is not open to students who have credit for Psychology 121.

***642. Psychopathology.** Three credit hours. Spring Quarter. Three lectures each week. Lectures, recitations, and reports. Prerequisite, Psychology 641. Mr. Goddard.

This course deals with the unusual (so-called pathological) manifestations of mind. Beginning with a consideration of subconscious phenomena—sleep, dreams, hypnosis, automatic writing, etc., there will be discussed: phobias, suggestion, the psychological aspects of hysteria, and multiple personality, psychasthenia, neurasthenia, and other disorders of personality.

This course is not open to students who have credit for Psychology 124.

645. History of Psychology. Five credit hours. Winter Quarter. Five lectures each week. Prerequisites, Psychology 629 and 630 or permission of instructor. Mr. Williams.

The course aims to view modern psychological problems in the light of their historical antecedents. The development of various theories such as those of sensation, attention, space perception, and emotion will be traced from earliest times to the present. As far as possible assignments will involve reference to original sources.

This course is not open to students who have credit for Psychology 139-140.

***646. Principles of Human Behavior.** Three credit hours. Spring Quarter. Three lectures each week. Prerequisite, sixteen hours in psychology. Mr. Weiss.

A study of the development of theories of human behavior and a consideration of the simplest assumptions necessary and sufficient to explain the facts of human behavior as dependent on social and biological conditions.

This course is not open to students who have credit for Psychology 118.

647. Theoretical Psychology. Three credit hours. Autumn Quarter. Three lectures each week. Prerequisite, sixteen hours in psychology. Mr. Weiss.

Lectures and assigned readings bearing on the evolution of psychological theory in its relation to the physical and the social sciences.

This course is not open to students who have credit for Psychology 153.

650. Minor Problems. One or more credit hours. Autumn, Winter, Spring Quarters. Prerequisite, sixteen hours in psychology. All instructors.

Investigation of minor problems in the various fields of psychology.

* Not given in 1924-1925.

By permission of the head of the department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff.

651. Psychology of the Elementary School Subjects. Three credit hours. Winter Quarter. Three lectures each week. Prerequisite, Psychology 607. Mrs. Pressey.

An analysis of the specific psychological processes involved in arithmetic, reading, writing, and other elementary school subjects, with consideration of the conditions which promote learning in each subject, and examination of textbooks and methods from this point of view.

This course is not open to students who have credit for Psychology 410.

652. Psychology of High School Subjects. Three credit hours. Autumn Quarter. Three lectures each week. Prerequisite, Psychology 607. Mr. Pressey.

An analysis of the specific psychological processes involved in algebra, language, science, and other high school subjects, with consideration of the conditions which promote learning in each subject, and examination of textbooks and methods from this point of view.

This course is not open to students who have credit for Psychology 410.

FOR GRADUATES

Prerequisite for Graduate Work: A student who desires to become a candidate for an advanced degree, with psychology as a major subject, must previously have completed the equivalent of at least two years of psychology; or he must have completed one year of psychology and one year of college work in one of the following subjects: philosophy, mathematics, physiology, physics, zoology, sociology.

801. Major Research. Three or more credit hours. Autumn, Winter, Spring Quarters. All instructors.

Primarily intended for students offering theses for advanced degrees.

By permission of the head of the department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff.

803. Seminary in Psychology. Two credit hours. Autumn, Winter, Spring Quarters.

805. Contemporary Psychological Literature. One credit hour. Autumn, Winter, Spring Quarters.

808. Psycho-Analysis. Two credit hours. Autumn Quarter. Two lectures each week. Mr. Goddard.

This course will deal with the history and development of psycho-analysis; the theories of Freud, Jung, and others. Current views of the unconscious together with discussion of the neurological basis for such of the concepts as may be thus explained; the method free association and the interpretation of dreams.

PUBLIC HEALTH

Office, Hamilton Hall

PROFESSORS HAYHURST AND McCAMPBELL, ASSISTANT PROFESSORS
SELBERT AND WILSON, MR. VAN BUSKIRK

FOR ADVANCED UNDERGRADUATES AND GRADUATES

601. Personal Hygiene. Three credit hours. Winter Quarter. Three lectures or recitations each week. Prerequisite, first two years of course preliminary to Medicine or five credit hours in college biological science. A previous course in chemistry is recommended. Mr. Hayhurst.

This course aims, in a somewhat technical manner, to point out the principles for maintaining personal health and efficiency.

This course is not open to students who have credit for Public Health 112.

602. Public Health Problems. Three credit hours. One Quarter. Autumn and Spring. Three recitations each week. Prerequisite, first two years of course preliminary to Medicine or five credit hours in college biological science. A previous course in chemistry and physics is strongly recommended. Given only on the Campus. Mr. Hayhurst.

A resume of theories and discoveries pertaining to the causes and prevention of disease. An elementary consideration of the public health aspects of such problems as food supplies, milk, water, sewage and refuse disposal, air and ventilation, communicable diseases, quarantine, maternity and infant welfare, housing and school hygiene, camp and rural sanitation, public service hygiene, tuberculosis, cancer, nostrums, and quackery, mental and industrial hygiene, vital statistics, health education and health administration.

This course is not open to students who have credit for Public Health 121.

603. Industrial Hygiene. Three credit hours. Winter Quarter. Three recitations each week. Prerequisite, first two years of course preliminary to Medicine or five credit hours in college biological science. A previous course in chemistry and physics is strongly recommended or that it be preceded by Public Health 602. Given only on the Campus. Mr. Hayhurst.

This course considers the hygiene of work and as such deals with the principles which underlie working efficiency, maximum production and the avoidance of loss time due to ill-health. The course consists of didactic work, lecture and demonstrations covering the various health hazards which operate in connection with industries, such as fatigue, inactivity, industrial infections, dust, faulty air-conditions and illumination, temperature extremes, poisons, abnormal atmospheric pressures, electrical hazards, etc. The methods of control, including governmental supervision, organization of industrial health services, physical examinations, the occupational diseases and compensation matters are included.

This course is not open to students who have credit for Public Health 122.

604. Preventive Medicine. Two credit hours. Autumn Quarter. Two recitations or demonstrations each week. Prerequisite, first three years of the curriculum in Medicine. Mr. Wilson.

Channels of infection and epidemiology. Water supplies, sewage and refuse disposal. Disinfection. Ventilation and heating. Principles of public health measures.

This course is not open to students who have credit for Public Health 115.

FOR GRADUATES

Prerequisite for Graduate Work: A student who desires to become a candidate for the Master's degree in Public Health must be (a) a graduate of a Class "A" medical school, or must hold (b) the degree of Bachelor of Arts or an equivalent degree from an acceptable institution, in which case he must also have completed the following preliminary subjects: chemistry (general and qualitative), 15 credit hours; physics, 10 credit hours; zoology (elementary), 5 credit hours; comparative anatomy (vertebrate), 5 credit hours; physiology, 5 credit hours; and bacteriology (general and pathogenic), 8 credit hours.

As a minimum qualification for the study of a graduate course in public health, the student must be majoring in a biological science in which case he may elect, as a minor, Public Health 801, 802, 803, or 808, or he must previously have completed the equivalent of 12 credit hours in science, of which at least 6 must have been in biological science, in which case he may elect Public Health 801, 802, 803, or 808. In the case of a student taking a major in education or sociology, Public Health 801, 802, 803, and 808 may be elected, with the permission of the instructor in charge.

801. Personal Hygiene. Three credit hours. Winter Quarter. Prerequisite or concurrent, Public Health 601. Mr. Hayhurst.

The applied anatomy and physiology of the human being with particular attention to questions of toleration, adaptation, results of faulty habits, tests of normality and abnormality, common afflictions and their avoidance, impairments and functional re-education, general prophylaxis, first aid and emergency treatments; mental hygiene.

This course is not open to students who have credit for Public Health 201.

802. Public Health Problems. Four credit hours. Autumn Quarter. Prerequisite or concurrent, Public Health 602. Mr. Hayhurst.

Efficiency of public health measures, organization of national, state, and local health departments, sanitary law and legal powers, and responsibilities of health officers. Current problems in hygiene and sanitation.

This course is not open to students who have credit for Public Health 205.

803. Industrial Hygiene. Five credit hours. Winter Quarter. Prerequisite or concurrent, Public Health 603. Mr. Hayhurst.

The industries, trades, and callings of chief hygienic import; the industrial health hazards technically considered; the occupational diseases; the general means of hygienic control and prevention. Includes laboratory, demonstrations, and inspection trips.

This course is not open to students who have credit for Public Health 202.

***807. Demography.** Two credit hours. Spring Quarter. Open only to students who are majoring in the curriculum in Public Health. Vital, social, and sanitary statistics.

This course is not open to students who have credit for Public Health 207.

*Not given in 1924-1925.

808. Social Service and Public Health Nursing. Two credit hours. Winter Quarter. For prerequisite see introductory statement. Mrs. Selbert.

Preventable diseases discussed from their social aspects. Relation between social science and preventive medicine. Existing agencies and principles involved in dealing with medico-sociological problems. History of nursing, organization and principles underlying public health nursing with particular reference to Ohio.

This course is not open to students who have credit for Public Health 208.

809. Communicable Diseases. Four credit hours. Autumn Quarter. For prerequisite see introductory statement. Mr. McCampbell.

***813. Public Health: Laboratory.** Four credit hours. Autumn Quarter. One lecture or conference and eight laboratory hours each week. Open only to students who are majoring in the curriculum in Public Health. Mr. Van Buskirk.

Methods and examinations employed in diagnosis of communicable diseases.

This course is not open to students who have credit for Public Health 213 or 214.

***814. Public Health: Laboratory.** Four credit hours. Winter Quarter. One lecture or conference and eight laboratory hours each week. Open only to students who are majoring in the curriculum in Public Health. Prerequisite, Public Health 813. Mr. Van Buskirk.

Water, food, and drug analyses.

This course is not open to students who have credit for Public Health 213 or 214.

***815. Public Health: Laboratory.** Four credit hours. Spring Quarter. One lecture or conference and eight laboratory hours each week. Open only to students who are majoring in the curriculum in Public Health. Prerequisite, Public Health 814. Mr. Van Buskirk.

Laboratory inspection methods of water, sewage, milk, food, and drug products.

This course is not open to students who have credit for Public Health 213 or 214.

816. Major Research. Six credit hours. Spring Quarter. For students who are majoring in the curriculum in Public Health and offering theses for the Master's degree. Prerequisite, first two Quarters of the curriculum in Public Health. All instructors.

This course is not open to students who have credit for Public Health 216.

817. Medical Aspects of Public Health Engineering. Two credit hours. Spring Quarter. Recitations and demonstrations. Open only to students who are majoring in the curriculum in Public Health. Prerequisites, Civil Engineering 602 and 703. Mr. Van Buskirk.

* Not given in 1924-1925.

The preventive medical aspects of engineering procedures.

This course is not open to students who have credit for Public Health 213, 214, 811 or 812.

RHETORIC AND ENGLISH LANGUAGE

(See English)

ROMANCE LANGUAGES AND LITERATURES

Office, 104 Hayes Hall

PROFESSORS HENDRIX, MOORE, AND HAVENS, ASSISTANT PROFESSOR AND
CHAIRMAN OF THE DEPARTMENT R. E. ROCKWOOD, ASSISTANT
PROFESSORS HACKER, GUTIERREZ, CONRAD,
AND FOURE, MR. WHATLEY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Acceptable courses in French in addition to any prerequisites stated in the description of the courses.

601. French Literature of the Seventeenth Century, 1600-1660. Five credit hours. One Quarter. Autumn and Spring. Five lectures each week. Lectures, collateral reading, and reports. The class is limited to fifty students. Mr. Rockwood.

The principal literary movements of the age: formation of the school of 1660. The Libertines, growth of French comedy and tragedy, The Précieuses, The French Academy will be discussed. Selected works of Malherbe, De Viau, Descartes, Balzac, and Corneille will be read.

This course is not open to students who have credit for French 109.

602. French Literature of the Seventeenth Century, 1660-1700. Five credit hours. Winter Quarter. Five lectures each week. Lectures, collateral reading, and reports. The class is limited to fifty students. Mr. Rockwood or Mr. Havens.

The school of 1660. Quarrel of the Ancients and the Moderns. Selected works of Molière, Racine, Pascal, La Bruyère, La Fontaine, La Rochefoucauld will be read.

This course is not open to students who have credit for French 110.

603. French Literature of the Nineteenth Century, 1800-1850. Five credit hours. One Quarter. Autumn and Spring. Five lectures each week. Mr. Moore, Miss Conrad.

Chateaubriand, Mme. de Stael, Balzac, de Musset, de Vigny, Hugo, Mérimée.

This course is not open to students who have credit for French 135.

604. French Literature of the Nineteenth Century, 1851-1900. Five credit hours. Winter Quarter. Five lectures each week. Miss Conrad.

Dumas fils, Augier, Flaubert, Daudet, Maupassant, Sardou, Rostand, Maeterlinck, and others.

This course is not open to students who have credit for French 136.

605. French Literature of the Fifteenth and Sixteenth Centuries. Three credit hours. Autumn Quarter. Three lectures each week. Given biennially, alternating with French 607-608. Prerequisite, French 601-602 or 603-604. Mr. Moore.

Villon, Rabelais and Montaigne.

This course is not open to students who have credit for French 139.

***607. Eighteenth Century French Prose.** Three credit hours. Autumn Quarter. Three lectures each week. Given biennially, alternating with French 605. Prerequisite, French 601-602 or 603-604. Mr. Havens.

Rapid reading, with lectures and reports. Special emphasis is placed upon Montesquieu, Voltaire, Diderot, and Rousseau.

This course is not open to students who have credit for French 137.

***608. Eighteenth Century French Drama.** Three credit hours. Winter Quarter. Three lectures each week. Prerequisite, French 601-602 or 603-604. Mr. Havens.

Special study of Crébillon, Voltaire, Marivaux, La Chaussée, Diderot, Beaumarchais, and others.

This course is not open to students who have credit for French 138.

***609. The French Novel of the Sixteenth, Seventeenth, and Eighteenth Centuries.** Three credit hours. Winter Quarter. Three lectures each week. Given biennially, alternating with French 611-612. Prerequisite, French 601-602 or 603-604. Mr. Havens.

Evolution of the Novel; Rabelais, Honoré d'Urfé, Mme. de LaFayette, Lesage, Marivaux, l'abbé Prévost, Rousseau, Voltaire, Diderot, Bernardin de St. Pierre. Lectures, reports, and collateral reading.

This course is not open to students who have credit for French 141.

***610. The French Novel of the Nineteenth Century.** Three credit hours. Spring Quarter. Three lectures each week. Given biennially, alternating with French 611-612. Prerequisite, French 601-602 or 603-604. Mr. Havens.

Mme. de Staël, Chateaubriand, George Sand, Hugo, Balzac, Flaubert, Maupassant, Zola, Daudet, France, Bazin, Loti, and others. Lectures, reports, and collateral reading.

This course is not open to students who have credit for French 142.

611. The Comedy of Manners in the Nineteenth Century, 1800-1880. Three credit hours. Winter Quarter. Three lectures each week. Given biennially, alternating with French 609-610. Prerequisite, French 601-602 or 603-604. Mr. Rockwood.

La Pièce à Thèse, La Pièce Bien Faite, Dumas fils, Augier, Scribe, Sardou. Rapid reading with lectures and reports.

This course is not open to students who have credit for French 145.

* Not given in 1924-1925.

612. *The Comedy of Manners in the Nineteenth Century, 1880-1922.* Three credit hours. Spring Quarter. Three lectures each week. Given biennially, alternating with French 609-610. Prerequisite, French 601-602 or 603-604. Mr. Rockwood.

Le Theatre Libre, Becque, Cure, Hervieu, Lavedan, Donnay, Bernstein, Bataille, Guitry. Rapid reading with lectures and reports.

This course is not open to students who have credit for French 146.

613. *History of French Literature, 942-1660.* Three credit hours. Winter Quarter. Three lectures each week. Prerequisites, French 621 and at least one course in French literature. Given biennially, alternating with French 625-626. This course is conducted in French. Mr. Fouré.

This course is not open to students who have credit for French 125.

614. *History of French Literature, 1660-1922.* Three credit hours. Spring Quarter. Three lectures each week. Prerequisites, French 621 and at least one course in French literature. Given biennially, alternating with French 625-626. This course is conducted in French. Mr. Fouré.

This course is not open to students who have credit for French 126.

622. *The Teaching of French.* Three credit hours. Spring Quarter. Three lectures each week. Prerequisite, six Quarters of collegiate French or the equivalent. Required of all students desiring the department recommendation as a teacher of French. Mr. Moore, Mr. Hacker, or Mr. Rockwood.

Special problems and difficulties in the teaching of French. Teacher's equipment. Classroom aids. Lectures, discussions, practice in conducting recitations. It is strongly recommended that this course be preceded by French 627, 628.

This course is not open to students who have credit for French 122.

623. *Intermediate French Conversation and Composition.* Three credit hours. One Quarter. Autumn and Winter. Three recitations each week. Prerequisite, French 621. This course is conducted in French. It is limited to twenty students. Mr. Fouré.

This course is not open to students who have credit for French 130.

624. *Intermediate French Conversation and Composition (Continued).* Three credit hours. One Quarter. Winter and Spring. Three recitations each week. Prerequisite, French 623. This course is conducted in French. It is limited to twenty students. Mr. Fouré.

This course is not open to students who have credit for French 130.

*625. *Explication de Textes.* Three credit hours. Winter Quarter. Three recitations each week. Given biennially, alternating with French 613-614. Prerequisites, French 623, 624, and a course in French literature. This course is conducted in French. Mr. Fouré.

* Not given in 1924-1925.

The course aims to introduce the student to a method of literary appreciation based upon a critical study of well selected texts representing the main characteristics of each writer. Examples will be taken from seventeenth and eighteenth century authors.

This course is not open to students who have credit for French 131.

***626. Explication de Textes (Continued).** Three credit hours. Spring Quarter. Three recitations each week. Given biennially, alternating with French 613-614. Prerequisite, French 623, 624, and a course in French literature. This course is conducted in French. Mr. Fouré.

Selections from the nineteenth century and contemporary authors.

This course is not open to students who have credit for French 132.

627. French Phonetics. Three credit hours. One Quarter. Autumn and Winter. Prerequisite, six Quarters of collegiate French or the equivalent, and the consent of the department. Required of all students desiring the department recommendation as a teacher of French. This class is limited to twelve. Mr. Hacker.

The formation of French sounds. Lectures, with exercises in the use of the symbols of the International Phonetic Association. A systematic study of the rules of French pronunciation. Careful drill in the reading of French. Designed for advanced students who expect to teach French.

This course is not open to students who have credit for French 123.

628. Review of French Syntax. Three credit hours. Winter Quarter. Open to graduate students who have had six Quarters of collegiate French or the equivalent with a grade not less than "C." Mr. Hacker.

A careful elucidation of French grammar, with composition to illustrate. Designed for advanced students who expect to teach French.

This course is not open to students who have credit for French 124.

ITALIAN

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Introductory course in Italian in addition to any prerequisites stated in the description of the courses.

601. Modern Italian Literature, 1800-1850. Five credit hours. One Quarter. Autumn and Spring. Five recitations each week. Mr. Moore.

Foscolo, Manzoni, Pellico, Leopardi.

This course is not open to students who have credit for Italian 105.

602. Modern Italian Literature, 1851-1900. Five credit hours. Winter Quarter. Five recitations each week. Mr. Moore.

Rovetta, Carducci, Giacosa, Fogazzaro.

This course is not open to students who have credit for Italian 106.

* Not given in 1924-1925.

***607. Italian Literature of the Renaissance.** Three credit hours. Autumn Quarter. Three recitations each week. Given biennially, alternating with Italian 611. Prerequisite, Italian 602 or the permission of the instructor. Mr. Moore.

Boiardo, Ariosto, Pulci, Machiavelli. Lectures, collateral reading, and reports.

This course is not open to students who have credit for Italian 107.

***608. Italian Literature of the Renaissance (Continued).** Three credit hours. Winter Quarter. Three recitations each week. Given biennially, alternating with Italian 612. Prerequisite, Italian 602 or the permission of the instructor. Mr. Moore.

Bandello, Il Lasca, Castiglione, Cellini, Tasso. Lectures, collateral readings, and reports.

This course is not open to students who have credit for Italian 108.

609. Survey of Italian Literature to 1400. Three credit hours. Winter Quarter. Three lectures each week. No prerequisites, and no knowledge of a foreign language required. Mr. Moore.

English translations of Dante, Petrarch, Boccaccio. Lectures, readings, and reports will be in English.

This course is not open to students who have credit for Italian 119.

610. Survey of Italian Literature, 1400-1900. Three credit hours. Spring Quarter. Three lectures each week. No prerequisites, and no knowledge of a foreign language required. Mr. Moore.

English translations of Ariosto, Machiavelli, Cellini, Castiglione, Tasso, Manzoni, and others. Lectures, readings, and reports will be in English.

This course is not open to students who have credit for Italian 120.

***611. Dante's Life and Works.** Three credit hours. Autumn Quarter. Three lectures each week. Alternates biennially with Italian 607. Prerequisite, Italian 602 or the permission of the instructor. Mr. Moore.

Reading of the Vita Nuova and The Inferno, Cantos 1-16.

***612. Dante's Life and Works (Continued).** Three credit hours. Winter Quarter. Three lectures each week. Alternates biennially with Italian 608. Prerequisite, Italian 611. Mr. Moore.

Reading of The Inferno, Cantos 17-34, Purgatorio and Paradiso.

SPANISH

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Introductory course in Spanish in addition to any prerequisites stated in the description of the courses.

603. Advanced Spanish. Five credit hours. One Quarter. Autumn, Winter, Spring. Five recitations each week. Mr. Gutierrez, Mr. Whatley.

Rapid reading of modern novels and plays, with emphasis on the early period of the nineteenth century.

This course is not open to students who have credit for Spanish 105.

* Not given in 1924-1925.

604. Advanced Spanish. Five credit hours. One Quarter. Autumn, Winter, Spring. Five recitations each week. Prerequisite, Spanish 603. Mr. Gutierrez, Mr. Whatley.

Rapid reading of novels and plays.

This course is not open to students who have credit for Spanish 106.

605. Advanced Composition and Conversation. Three credit hours. Winter Quarter. Three recitations each week. Mr. Gutierrez.

This course, conducted wholly in Spanish, is designed especially for prospective teachers and for persons desiring a practical command of the language. The subject matter will be, in large part, the geography and history of Spain and Spanish-America.

This course is not open to students who have credit for Spanish 113.

606. Advanced Composition and Conversation (Continued). Three credit hours. Spring Quarter. Three recitations each week. Prerequisite, Spanish 605. Mr. Gutierrez.

This course, conducted wholly in Spanish, is designed especially for prospective teachers and for persons desiring a practical command of the language. The subject matter will be, in large part, the geography and history of Spain and Spanish-America.

This course is not open to students who have credit for Spanish 114.

***607. The Modern Spanish Novel.** Five credit hours. Autumn Quarter. Five recitations each week. Given biennially, alternating with Spanish 609-610. Prerequisite, Spanish 105-106 or 603-604. Mr. Hendrix.

A careful study of the development of the modern Spanish novel, reading of representative authors. Lectures, collateral reading, and reports.

This course is not open to students who have credit for Spanish 119.

***608. The Modern Spanish Novel (Continued).** Five credit hours. Winter Quarter. Five recitations each week. Given biennially, alternating with Spanish 609-610. Prerequisite, Spanish 603-604. Mr. Hendrix.

A careful study of the development of the modern Spanish novel, reading of representative authors. Lectures, collateral reading, and reports.

This course is not open to students who have credit for Spanish 119-120.

609. Romantic Drama and Poetry of the Nineteenth Century. Five credit hours. Winter Quarter. Five recitations each week. Given biennially, alternating with Spanish 607-608. Prerequisite, Spanish 603-604. Mr. Hendrix.

A survey of the movements in Spanish drama and poetry during the first half of the nineteenth century. Lectures, collateral reading, and reports.

This course is not open to students who have credit for Spanish 121.

610. Modern Spanish Drama. Five credit hours. Spring Quarter. Five recitations each week. Given biennially, alternating with Spanish 607-608. Prerequisite, Spanish 603-604. Mr. Hendrix.

A survey of the movements in Spanish drama and poetry during the second half of the nineteenth century. Lectures, collateral reading, and reports.

This course is not open to students who have credit for Spanish 122.

* Not given in 1924-1925.

***611. Drama of the Golden Age.** Five credit hours. Autumn Quarter. Five recitations each week. Given biennially, alternating with Spanish 613-614. Prerequisite, Spanish 603-604. Mr. Whatley.

An intensive study of a limited number of plays of the representative dramatists. Lectures, collateral reading, and reports.

This course is not open to students who have credit for Spanish 123.

***612. Drama of the Golden Age (Continued).** Five credit hours. Winter Quarter. Five recitations each week. Given biennially, alternating with Spanish 613-614. Prerequisite, Spanish 603-604. Mr. Whatley.

An intensive study of a limited number of plays of the representative dramatists. Lectures, collateral reading, and reports.

This course is not open to students who have credit for Spanish 124.

613. Prose of the Golden Age. Five credit hours. Autumn Quarter. Five recitations each week. Given biennially, alternating with Spanish 611-612. Prerequisite, Spanish 603-604. Mr. Whatley.

A study of the prose of the period with especial emphasis on the novel. Lectures, collateral reading, and reports.

This course is not open to students who have credit for Spanish 125.

614. Prose of the Golden Age (Continued). Five credit hours. Winter Quarter. Five recitations each week. Given biennially, alternating with Spanish 611-612. Prerequisite, Spanish 603-604. Mr. Whatley.

A study of the prose of the period with especial emphasis on the novel. Lectures, collateral reading, and reports.

This course is not open to students who have credit for Spanish 126.

615. Survey of Spanish Literature from the Earliest Times to the End of the Nineteenth Century. Five credit hours. Autumn Quarter. Five lectures each week. Prerequisite, Spanish 603-604.

This course is not open to students who have credit for Spanish 131.

616. Survey of Spanish Literature from the Earliest Times to the End of the Nineteenth Century (Continued). Five credit hours. Winter Quarter. Five recitations each week. Prerequisite, Spanish 603-604. Mr.

This course is not open to students who have credit for Spanish 132.

***617. Advanced Syntax.** Three credit hours. Winter Quarter. Three recitations each week. Prerequisite, Spanish 603-604 and the consent of the instructor. Mr. Hendrix.

Study of syntax.

This course is not open to students who have credit for Spanish 115.

618. The Teaching of Spanish. Three credit hours. Spring Quarter. Three recitations each week. Prerequisite, Spanish 603-604 and the consent of the instructor. Mr. Hendrix, Mr. Whatley.

Methodology and bibliography.

This course is not open to students who have credit for Spanish 116.

ROMANCE LANGUAGES

FOR GRADUATES

Prerequisite for Graduate Work: For admission to all of the following courses the student must have at least four Quarters of collegiate work, five hours a week, each Quarter. Other prerequisites are stated in the descriptive material for each course.

Students intending to major in Romance Languages are urged to elect the following courses outside the department: History of France (European History 631-632), Introduction to the Study of the History of Language (Greek 701), the History of Philosophy (Philosophy 601-602), the History of Critical Theory (English 805), Roman and Comparative Literature (Latin 606), Latin 603, 604 (Advanced Reading). No student will be considered as a candidate for the M.A. degree unless his program includes at least two courses exclusively for graduates.

801. Introduction to Old French. Three credit hours. Autumn Quarter. Prerequisite, four years of collegiate French. Mr. Hacker.
Old French phonology and morphology. Reading in the Chanson de Roland.

802. Introduction to Old French (Continued). Three credit hours. Winter Quarter. Mr. Hacker.

***803. Old Provençal.** Three credit hours. Autumn Quarter. Prerequisite, four years of collegiate French. Mr. Moore.

Study of the language and literature of the Troubadours; Appel's *Provenzalische Chrestomathie* (Leipzig, 4th edition); Grandgent's *Provençal Phonology and Morphology*.

***804. Old Provençal (Continued).** Three credit hours. Winter Quarter. Prerequisite, four years of collegiate French. Mr. Moore.

Study of the language and literature of the Troubadours; Appel's *Provenzalische Chrestomathie* (Leipzig, 4th edition); Grandgent's *Provençal Phonology and Morphology*.

805. Old Spanish. Three credit hours. Winter Quarter. Prerequisite, not less than three years of collegiate Spanish and the permission of the instructor in charge. Mr. Hendrix.

806. Old Spanish (Continued). Three credit hours. Spring Quarter. Prerequisite, not less than three years of collegiate Spanish and the permission of the instructor in charge. Mr. Hendrix.

***807. The French Romantic Novel.** Three credit hours. One Quarter. Prerequisite, three years of collegiate French and the permission of the instructor in charge. Mr. Havens.

A critical study with lectures, assigned readings, and reports, of Chateaubriand, Mme. de Staël, Hugo, Lamartine, Musset, Gautier, de Vigny, Sand, and others.

* Not given in 1924-1925.

*808. French Romantic Drama. Three credit hours. Autumn Quarter. Prerequisite, three years of collegiate French and permission of the instructor in charge. Mr. Havens.

A critical study with lectures, assigned readings, and reports, of Hugo, Musset, de Vigny, Dumas père, and others.

809. Research in French Literature. Three to five credit hours. Winter Quarter. Prerequisite, not less than four years of collegiate French and the permission of the instructor in charge. Mr. Moore, Mr. Havens, Mr. Rockwood, Mr. Hacker.

This course is designed to meet the needs of individual graduate students who are pursuing a major study in the Department of Romance Languages.

810. Research in Spanish Literature. Two to five credit hours. Winter and Spring Quarters. Prerequisite, not less than three years of collegiate Spanish and the permission of the instructor in charge. Mr. Hendrix.

This course is designed to meet the needs of individual graduate students who are pursuing a major study in the Department of Romance Languages.

811. Seminary in French Literature. Three credit hours. Autumn Quarter. Prerequisite, three years of collegiate French and the permission of the instructor. Mr. Havens.

Studies in specific literary fields. The subject for 1924-1925 will be: French and English literary relations during the eighteenth century.

812. Seminary in French Literature (Continued). Three credit hours. Winter Quarter. Prerequisite, three years of collegiate French and the permission of the instructor. Mr. Havens.

Studies in specific literary fields. The subject for 1924-1925 will be: French and English literary relations during the eighteenth century.

813. Old French Literature. Three credit hours. Spring Quarter. Prerequisite, French 601 or French 603. Mr. Moore.

Rapid reading of the *Chanson de Roland*, *Aucassin et Nicolette*, and the *Lais* of Marie de France.

This course is not open to students who have credit for French 219.

*814. Old French Literature. Three credit hours. Spring Quarter. Prerequisite, French 813. Mr. Moore.

Rapid reading of the *Roman de Troie*, the *Tristan* of Beroul, *Chigès*, the *Roman de Renard*, and selected *Fabliaux*.

815. Seminary in Spanish Literature. Three credit hours. Winter and Spring Quarters. Lectures, readings, and reports. Prerequisite, three years of collegiate Spanish and permission of the instructor in charge. Mr. Hendrix.

* Not given in 1924-1925.

RURAL ECONOMICS

Office, 113 Townshend Hall

PROFESSOR FALCONER, ASSISTANT PROFESSORS LIVELY AND McBRIDE,
MR. MORISON**FOR ADVANCED UNDERGRADUATES AND GRADUATES**

Prerequisite for All Courses in This Group: Fundamental courses in rural economics in addition to any prerequisites stated in the description of the courses. Course 608 requires also an introductory course in sociology.

601. Accounts for Country Elevators and Marketing Organizations. Three credit hours. Spring Quarter. One lecture and two two-hour laboratory periods each week. Mr. Morison.

Accounts and business practice for country marketing associations.

This course is not open to students who have credit for Rural Economics 120.

602. Farm Cost Accounts. Three credit hours. Winter Quarter. Two lectures and one three-hour laboratory period each week. Mr. Falconer.

A study of systems of cost accounts in their application to the problems of farm organization and operation. The interpretation of cost figures.

This course is not open to students who have credit for Rural Economics 102.

603. Cooperation in Agriculture. Three credit hours. Winter Quarter. Two lectures and one two-hour laboratory period each week. Mr. McBride.

A study of agricultural cooperation, mainly as found in the United States. The types of cooperative marketing, manufacturing and purchasing organizations, collective bargaining, cooperative credit and insurance.

This course is not open to students who have credit for Rural Economics 116.

604. Land Tenure. Three credit hours. Spring Quarter. Three lectures each week. Mr. Falconer.

Historical and comparative study of land tenure with special reference to the relation of the landlord and tenant to each other and to the land. A land policy for the United States.

This course is not open to students who have credit for Rural Economics 114.

605. The Agricultural Industry. Three credit hours. Winter Quarter. Three lectures each week. Mr. Falconer.

The importance of the agricultural industry to the welfare of the nation. Some characteristics of the farming industry. The maintaining of our agricultural output. Foreign competition present and prospective. State and federal regulation, encouragement and aid to agriculture in the United States and foreign countries.

606. Sociology of Farm Folk. Five credit hours. Winter Quarter. Mr. Lively.

A survey of the field of students desiring to take further work in rural sociology. The backgrounds and evolution of the rural community and country life; rural population, communication, cooperation, conveniences, health; rural social institutions, especially the family, school, church, and social center in relation to country life; rural organization, leadership, surveys, social agencies.

607. Rural Organization. Three credit hours. Autumn Quarter. Prerequisite, Rural Economics 606 or permission of the instructor. Mr. Lively.

The need of rural organization; the conditions and units of successful rural organization, including a study of rural group life; the family, neighborhood, and community; the agencies and methods of rural organization, including a survey of existing organizations, their scope and aims, characteristics of successful leadership, its source and training; forces which favor and retard rural organization. Readings, lectures, discussions, and investigations.

This course is not open to students who have credit for Rural Economics 118.

608. Rural Social Outlook. Three credit hours. Winter Quarter. Prerequisite, Rural Economics 606 or 607. Mr. Lively.

A consideration of the viewpoint of rural people regarding rural social questions and reforms through a study of the avenues of rural expression. Relation of present rural organization to this outlook. Changing rural agencies and their effects upon viewpoint. Students should have a first-hand knowledge of country life and some knowledge of psychology.

NOTE: Attention is called to Sociology 816, Spring Quarter. Agricultural students who have had Rural Economics 607 will be admitted to this course by permission of the instructor in rural sociology. Such students will be directed by Mr. Lively in the methods of studying rural social problems.

701. Special Problems. Three to fifteen credit hours, given in units of three or five hours a Quarter for one or more Quarters. Autumn, Winter, Spring Quarters. Prerequisite, at least eight hours of work in the department and the consent of the instructor. Mr. Falconer, Mr. Lively, Mr. McBride.

This course is for students who desire to work out special problems in the field of rural economics.

FOR GRADUATES

Prerequisite for Graduate Work: The prerequisite for graduate work in this department is an acceptable course in the principles of economics, and one year's study of farm management and agricultural economics.

801. Research Work and Seminary in Rural Economics. Three to six credit hours. Autumn, Winter, Spring Quarters. Opportunity is offered to carry on special research in agricultural economics and rural sociology. Mr. Falconer, Mr. Lively, Mr. McBride.

SCHOOL ADMINISTRATION

Office, 213 Hayes Hall

PROFESSORS McCracken and Morrison,
ASSISTANT PROFESSOR REEDER

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in school administration and one year of experience, in addition to any prerequisites stated in the description of the courses.

601. Child Accounting. Three credit hours. One Quarter. Autumn, Winter, Spring. Three lectures each week. Assigned readings, investigations, and reports. All instructors.

A thorough study of information concerning the group to be educated, in so far as it affects school administration. Census, the information it should secure and its use; attendance, classification, individual differences, grading and promotion, retardation and acceleration, elimination, reports on physical, mental and pedagogical progress. Marking systems. Plans for caring for exceptional pupils, special schools and courses. Definition of terminology.

***603. Curriculum Building.** Three credit hours. Autumn Quarter. Three lectures each week. Assigned readings, investigations, and reports. Open to graduate students with permission of instructor in charge. Mr. Ashbaugh.

An analysis of the materials in the school curriculum from the standpoint of their origin, the contribution which they are expected to make to the education of a citizen in a democracy and their relation to the social demands of the present. Fundamental principles will be sought and both old and new materials will be evaluated in the light of these principles.

604. Administration of the Curriculum. Three credit hours. Winter Quarter. Three lectures each week. Assigned readings, investigations, and reports. Open to students with permission of instructor in charge. Mr. Ashbaugh.

An examination of the experimental evidence bearing upon the administrative problems concerned with the curriculum. Placement of subject matter in the grades; program making for different types of schools; problems involved; regular and special subjects. Standard for selection of textbooks; administration of free textbooks.

605. The Teaching Corps. Three credit hours. Winter Quarter. Three lectures each week. Assigned readings and reports. Open to graduate students with permission of instructor in charge. Mr. Reeder.

The preparation, appointment, tenure, assignment, and rating of teachers; training in service, professional activities and relation to school officials.

606. Building and Equipment. Three credit hours. Autumn Quarter. Three lectures each week. Assigned readings and reports. Open to graduate students with permission of instructor in charge. Mr. McCracken.

A study of types of building, choice of site, construction and suitability for educational needs; a study of present-day equipment for school buildings. The use of score

* Not given in 1924-1925.

cards for rating buildings: rural, village and city. Standard for maintenance, repairs and janitorial service. Methods of studying efficiency of various types of service systems.

607. School Finance. Three credit hours. Winter Quarter. Three lectures each week. Assigned readings, investigations, and reports. Open to graduate students with permission of instructor in charge. Mr. Reeder.

Present and potential sources of revenue; ability to support education; schemes of state aid; bases of distribution of state moneys; publicity campaigns for financial support; financial reports and surveys.

608. Business Management of Schools. Three credit hours. Spring Quarter. Three lectures each week. Assigned readings, investigations and reports. Open to graduate students with permission of the instructor in charge. Mr. Reeder.

Making the budget; payment for operation and maintenance of buildings; depreciation, insurance and bond issues; purchase and distribution of supplies; taking inventories; studies of unit costs; systems of accounting and bookkeeping; the business manager.

609. Extra-curricular Activities. Three credit hours. Spring Quarter. Three lectures each week. Assigned readings, investigations, and reports. Mr. Reeder.

A study of those activities which fall outside of the group for which academic credit is ordinarily given. The relation of school administration to non-school community activities. Responsibility of the principal and superintendent for the school as a community center.

610. The Administration of Rural Education. Three credit hours. Autumn Quarter. Three lectures each week. Assigned readings, investigations, and reports. Mr. McCracken.

An analysis of the problems of county and village superintendents; factors underlying rural school administrative problems; comparison of rural administrative problems in Ohio with those in other states.

This course is not open to students who have credit for School Administration 103.

611. State Administration of Education in the United States. Three credit hours. Spring Quarter. Three lectures each week. Assigned readings, investigations, and reports. Mr. McCracken.

A comparative study of school administration in the various American states including such topics as federal and state policies, forms of control, revenue and its apportionment, the state and the teacher, the state and the child, the state and non-state education.

This course is not open to students who have credit for School Administration 122.

***612. Administration of National Systems of Education. Three credit hours. Winter Quarter. Three lectures each week. Assigned readings, investigations, and reports.**

A comparative study of school administration in the various foreign countries.

* Not given in 1924-1925.

613. Educational Statistics. Three credit hours. Autumn Quarter. Two lectures and one two-hour laboratory period each week. Assigned readings and problems. Open to superintendents, principals, and graduate students of experience by permission of the instructor in charge. Mr. Morrison.

Thorough practice in use of frequency distribution, simple graphic method of presentation, mode, average, median, standard deviation, mean deviation, probable error, reliability, percentiles, correlation by different methods. Illustrative data and practice material from offices of principals and superintendents.

This course is not open to students who have credit for School Administration 115.

618-619-620. Minor Research Problems. Two to four credit hours. Autumn, Winter, Spring Quarters. Prerequisite, permission of the department. All instructors.

Investigation of minor problems in the various fields of school administration. A written report on the assigned problem will be required.

By permission of the head of the department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff.

621-622-623. Proseminary (Teachers in Service). Two credit hours. Autumn, Winter, Spring Quarters. Two lectures each week. Assigned readings and reports. Open to superintendents, principals, and teachers in service by permission of the instructor in charge. Mr. Morrison, Mr. Reeder.

Topics for study will be determined by the group within certain limits set by the department.

624. Administration of Standard Tests in Elementary Schools. Three credit hours. Autumn Quarter. Three lectures each week. Assigned readings and reports. Open to graduate students of experience with permission of the instructor in charge. Prerequisite, School Administration 613. Mr. Morrison.

Selection of tests and organization of testing program for elementary schools; administrative problems involved in different types of schools and school systems; publicity and reports; use of data in formulating and evaluating administrative policies, remedial programs; the organization and work of bureaus of educational research.

This course is not open to students who have credit for School Administration 615.

625. Administration of Standard Tests in Secondary Schools. Three credit hours. Winter Quarter. Three lectures each week. Assigned readings and reports. Open to graduate students of experience with permission of the instructor in charge. Prerequisite, School Administration 613. Mr. Morrison.

Selection of tests and organization of testing program for secondary schools; the use of mental and educational tests in classification, diagnosis, prognosis, and educational guidance; adaptations of organization, curricula and method to the educational needs of pupils of junior and senior high school age; recent investigations through the use of tests in the field of secondary education.

This course is not open to students who have credit for School Administration 615.

626. Administration of Health Education. Three credit hours. Spring Quarter. Three lectures each week. Assigned readings, investigations and reports. Mr. McCracken.

The place of health administration in school administration. Medical inspection; school nurse, dentist, and home visitor. Relation of school authorities to public health education. Hygiene of instruction; health of the teacher.

This course is not open to students who have credit for School Administration 104 or 602.

***627. Administration of Vocational Education.** Three credit hours. Spring Quarter. Three lectures each week. Assigned readings, investigations and reports. Open to graduate students with permission of instructor in charge.

A course covering the facts and principles involved in vocational education, together with a study of vocational guidance in the public schools.

This course is not open to students who have credit for School Administration 135.

FOR GRADUATES

Prerequisite for Graduate Work: Those desiring to do graduate work with school administration as either a major or minor subject must have not less than one year of satisfactory experience in educational service, in addition to three credit hours in school administration, and six credit hours in either psychology, sociology, economics, philosophy, history of education, or philosophy of education.

801. Administration of Higher Education. Three credit hours. Autumn Quarter. Three lectures each week. Assigned readings, investigations and reports. Open on permission of instructor in charge. Prerequisite, one year of experience and nine hours of school administration.

An investigation of the various types of control, organization, and administrative policies as illustrated in selected colleges, universities, technical schools, junior colleges, normal schools, and normal colleges.

802. Seminary in School Administration. Two to five credit hours. Autumn, Winter, Spring Quarters. Open to superintendents, principals, and teachers of graduate standing by permission of the instructor in charge. Prerequisite, one year of experience and nine hours of school administration. All instructors.

A study of general administrative problems.

803. Ad Interim Projects. Two to five credit hours. Autumn, Winter, Spring Quarters. Open to superintendents, principals, and teachers of graduate standing who are in active service, by permission of the head of the department. Prerequisite, one year of experience and nine hours of school administration. All instructors.

Projects carried on by graduate students who have been enrolled previously in the department.

805-806-807. Major Research Problems. Three credit hours or more. Autumn, Winter, Spring Quarters.

* Not given in 1924-1925.

Investigation of administrative problems leading to preparation of theses for advanced degrees.

By permission of the head of the department and the Director of the Bureau of Educational Research, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff.

SOCIOLOGY

Office, Commerce Building

PROFESSORS HAGERTY, NORTH, LUMLEY, AND MARK, MR. VAN KEUREN,
MR. WEST, MR. WHEELER, MISS BOYSON, MR. DENUNE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in sociology in addition to any prerequisites stated in the description of the courses.

601. The Family. Four credit hours. One Quarter. Autumn and Spring.

A study of the matrimonial institutions and family organization in the different stages of social development—primitive, Greek, Roman, mediaeval, modern. The modern family, its functions and problems.

This course is not open to students who have credit for Sociology 107.

605. The Immigrant. Four credit hours. Autumn Quarter. Four meetings each week.

The causes and sources of immigration, racial traits and European backgrounds of the several immigrant groups; problems of immigrant adjustment, and regulation of immigration.

This course is not open to students who have credit for Sociology 104.

607. American Race Problems. Four credit hours. Winter Quarter. Four meetings each week.

Racial traits, backgrounds, and problems of the Indian, the Mexican, the Oriental, and the colored American. Means of promoting proper race relations.

This course is not open to students who have credit for Sociology 134.

615. Poverty and Dependence. Four credit hours. Autumn Quarter. Three meetings and laboratory each week. Miss Boyson.

The relation of the standard of living to social welfare. Extent, nature, and causes of destitution in the United States. Outlines of a program of prevention. Nature of dependence. Theory of charity and brief history of its development. Poor-law development in England and the United States and agencies of administration.

This course is not open to students who have credit for Sociology 111.

616. The Handicapped, Defectives, and Dependents. Four credit hours. Winter Quarter. Three meetings and field trip each week. Miss Boyson.

The social status of the blind, the deaf, the crippled, the insane, the feeble-minded, the epileptic, the psychopathic, the homeless and detached, the aged and infirm. The causes for the existence of these groups, social provision for their treatment, modern programs of prevention. Visits of observation to state and other institutions for the care of these groups.

This course is not open to students who have credit for Sociology 109.

617. Needy Families and Children. Four credit hours. Spring Quarter. Three meetings and field trip each week. Miss Boyson.

Principles and methods of aiding needy families living in their own homes. Public and private relief agencies. The mothers' pension movement. The sick poor, medical charities, and medical social work. Emergency and disaster relief. Legal and remedial loans. Dependent and neglected children, principles and agencies of care.

This course is not open to students who have credit for Sociology 112.

625. The Criminal. Three credit hours. Spring Quarter. Three meetings each week. Mr. Hagerty.

The social, economic, and physiological causes of crime. The changing character of crime as modified by the legal code. Types of criminals, the instinctive, habitual, professional, etc. The classical and positive schools of criminology. The relation of feeble-mindedness and degeneracy to crime. Juvenile crime, its causes and prevention.

This course is not open to students who have credit for Sociology 131.

626. Penology. Three credit hours. Autumn Quarter. Three meetings each week. Mr. Hagerty.

The evolution of the methods of criminal procedure with an analysis and criticism of present-day methods. The juvenile court and the legal procedure it introduces. The indeterminate sentence and the parole and probation system.

This course is not open to students who have credit for Sociology 132.

627. Penology. Three credit hours. Winter Quarter. Three meetings each week. Prerequisite, Sociology 626. Mr. Hagerty.

The organization and administration of penal institutions. As visits will be made to courts, jails, and prisons, students who take this course should be free to make these visits Saturday morning.

This course is not open to students who have credit for Sociology 132.

635-636-637. Social Statistics. Three credit hours. Autumn, Winter, Spring Quarters. Two lectures and two hours of laboratory or field work each week. Miss Mark.

The application of statistical methods to social research; collecting, arranging, and interpreting statistical data. Schedules; tables; averages and ratios; graphic presentation. A study of the fields of population and vital statistics, dependency, delinquency, and standard of living.

This course is not open to students who have credit for Sociology 135 and 136.

645. Leisure and Recreation. Four credit hours. Autumn Quarter. Four meetings each week. Mr. Van Keuren.

The sources of leisure in early and modern society. The social significance and uses of leisure. The social functions of play. Historical aspects of play. The recreation

problem of modern communities from the standpoint of control and of public provision.

This course is not open to students who have credit for Sociology 127.

646. Social Organization and Administration of Recreation Facilities. Four credit hours. Winter Quarter. Four meetings each week. Prerequisite, Sociology 645. Mr. Van Keuren.

Methods and means of control of commercialized recreation with special reference to American cities and towns. The promotion and organization of public and semi-public agencies. The administrative control of playgrounds, social centers, clubs, and other non-commercialized agencies. The coordination of the recreation facilities of the community.

This course is not open to students who have credit for Sociology 128.

***650. Boys' Work Organization.** Four credit hours. Autumn Quarter. Prerequisites, Sociology 645 and 646. Mr.

A study of the organization and methods of work of the principal agencies engaged in boys' work, such as the Boy Scouts, Young Men's Christian Association, Settlement Clubs for Boys. The principal part of the instruction will be given by specialists from the various agencies. Practical field work with some one of the agencies during the course will be required.

651. Girls' Work Organization. Four credit hours. Spring Quarter. Prerequisites, Sociology 645 and 646. Mr.

A study of the plan of organization and methods of work of the principal agencies engaged in girls' work, such as the Girl Scouts, Camp Fire Girls, Young Women's Christian Association, Settlement Clubs for Girls. The principal part of the instruction will be given by specialists from the various agencies. Practical field work with some one of the agencies during the course will be required.

652-653. Administration of Social Settlements, Community Houses, School Centers. Two credit hours. Winter and Spring Quarters. Mr. Wheeler.

Methods of organizing. Determination and development of programs. Personnel and executive factors. Financing, business methods. Publicity, reports, and records. Practice work in settlements and community houses.

655. Municipal Sociology. Four credit hours. Winter Quarter. Four meetings each week.

The place of the city in social organization. Comparison of the ancient, medieval, and modern city. Causes of growth of modern cities. Composition of urban population. Racial, cultural, and economic groupings of population. Problems of city planning, housing, health, intellectual, and aesthetic satisfaction. Control of vice and crime. Agencies for the cultivation and expression of civic interest.

This course is not open to students who have credit for Sociology 133.

656. Rural Social Institutions. Four credit hours. Spring Quarter. Four meetings each week. Mr. Denune.

The problems of health, recreation, social intercourse, housing, child welfare, dependency, defectiveness, and delinquency in American rural communities and small towns. The agencies and organizations dealing with these problems.

* Not given in 1924-1925.

This course is not open to students who have credit for Sociology 148.

665. Social Order and Social Control. Three credit hours. Autumn Quarter. Three recitations each week. Textbooks, lectures, papers, and discussions. Mr. Lumley.

The social order, its nature, its varieties, its origin; the agencies of social control, such as custom, conventionality, social suggestion, public opinion, law, education, religion, art, ceremony, ideals, personality. Additional readings for graduate credit.

This course is not open to students who have credit for Sociology 125.

666. Social Evolution. Three credit hours. Winter Quarter. Three recitations each week. Textbooks, lectures, papers, and discussions. Mr. Lumley.

A systematic review of primitive social organization; the forms and development of industry, marriage and the family, the arts of gratification, religion, government; the fact of social evolution; the methods of social evolution such as variation, selection, transmission, adaptation. Additional readings for graduate credit.

667. Social Progress. Three credit hours. Spring Quarter. Three recitations each week. Textbooks, lectures, papers, and discussions. Mr. Lumley.

A study of the various theories and the criteria of social progress. Extra readings for graduate credit.

This course is not open to students who have credit for Sociology 126.

675. Field Work in Sociology. Twelve credit hours. One Quarter. Autumn, Winter, Spring. Open to graduate students by permission of the instructor. Miss Boyson.

Practical work in the fields of family and child welfare, penology, Americanization, industry, or recreation under the supervision of organizations in these fields and the instructor.

This course is not open to students who have credit for Sociology 115-116.

695-696. Social Case Work. Three credit hours. Winter and Spring Quarters. Open to graduate students by permission of the instructor. Miss Boyson.

A critical analysis of the technique and methods of social treatment, with particular reference to family service, dependent and neglected children, juvenile delinquents, medical social cases. Record writing and analysis.

This course is not open to students who have credit for Sociology 149-150.

FOR GRADUATES

801-802-803. History of Sociological Thought. Two credit hours. Autumn, Winter, Spring Quarters. One session each week. Readings, reports, lectures, and discussions. Open only to graduate students. Mr. Lumley.

A survey of the most important literature of sociological theory, preceded by an examination of the writings of the Utopians, the philosophers of history and the social reformers.

805-806-807. American Sociological Theory. Two credit hours. Autumn, Winter, Spring Quarters. One session each week. Readings, reports, lectures, and discussions. Open only to graduate students. Mr. Lumley.

An intensive study of the theories concerning the origin, development, forms and nature of society, advanced by the leading American sociologists.

811. The State and Social Welfare. Four credit hours. Winter Quarter. Mr. North.

A critical examination of the theory and practice of governmental action for social welfare by the federal, state, and local units. The public school as an agency of social welfare. State and local provision for health, recreation, care of dependents and defectives. City departments of public welfare. State supervision of private charities. Relation of public and private welfare agencies.

812. Modern Social Welfare Movements. Four credit hours. Autumn Quarter. Mr. North.

A study of the history, functions, and organization of the more important modern welfare agencies and movements, as the social settlement, charity organization society, Red Cross, children's agencies, health organizations, etc. The social work of the church and allied religious organizations. The field and function of the voluntary agency.

815. Community Organization. Four credit hours. Spring Quarter. This course must be taken in connection with Sociology 816. Mr. North.

A concrete study of principles, methods, and problems involved in developing local community programs. The work will be developed by contact with actual community life. Some traveling expense will be involved in visiting communities.

816. Community Surveys. Four credit hours. Spring Quarter. Prerequisites, Sociology 635, 636, 637. This course must be accompanied by Sociology 815. Miss Mark.

Methods and technique of studying the social life of communities. Practice work in planning and executing field studies.

Students taking this course must be prepared to bear the expense of making their field studies outside of Columbus.

This course is not open to students who have credit for Sociology 140.

821-822-823. Graduate Seminary. Two credit hours. Autumn, Winter, Spring Quarters. All instructors.

Graduate students and the instructors in the department will meet regularly for the presentation of the results of investigations, the review of current sociological literature, and the discussion of current problems.

831-832-833. Administration of Social Agencies. Four credit hours. Autumn, Winter, Spring Quarters. Mr. West.

A study of the backgrounds of social work; the development of federation movements and the organization of financial and non-financial councils of social agencies; confidential exchanges; endorsement committees; the problems of financing social agencies, endowments, foundations, community chests, state subsidies, financial campaigns, and budget making. Office and personnel efficiency; education publicity including the application of the laws of salesmanship to social service; the administration of the various types of social agencies, public and private.

841-842-843. Research in Social Statistics. One to three credit hours. Autumn, Winter, Spring Quarters. Open to graduate students who have had statistical training, upon the consent of the instructor. Miss Mark.

Individual study in some field of statistical investigation under the direction of the instructor.

SOILS

Office, 203 Townshend Hall

PROFESSOR BEAR, ASSISTANT PROFESSOR CONREY, MR. McCLURE

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in soils in addition to any prerequisites stated in the description of the courses.

601. Theory and Practice in Soil Management. Three credit hours. Autumn Quarter. Three lectures each week. Mr. Bear.

A review of some of the more important investigational work which has been and is now being done with soils as related to field practice.

This course is not open to students who have credit for Soils 153.

602. Chemical Analysis of Soils. Five credit hours. Winter Quarter. Two lectures and three three-hour laboratory periods each week. Mr. McClure.

A complete analysis of a soil with training in the more refined analytical procedures as applied to soils.

This course is not open to students who have credit for Soils 155.

603. Origin and Classification of Soils. Three credit hours. Spring Quarter. Two lectures and one three-hour laboratory period each week. Mr. Conrey.

The characteristics of soils and their significance with special reference to Ohio. Laboratory work in soil mapping, field trips to the experimental farm at Wooster and to several substation farms.

This course is not open to students who have credit for Soils 157.

604. Physico-Chemical Analysis of Soils. Five credit hours. Winter Quarter. Two lectures and three three-hour laboratory periods each week. Prerequisites, Soils 602 or an acceptable course in quantitative analysis, and a course in physics. Mr. Conrey.

A study of the soil as a physico-chemical system; colloids absorption, soil solution, reaction velocities employing freezing point, conductivity, hydrogen electrode, spectroscopy, and other physico-chemical methods.

605. Bio-Chemical Analysis of Soils. Three credit hours. Spring Quarter. Three three-hour laboratory periods each week. Mr. Bear, Mr. Valley.

A chemical study of oxidation, reduction, and carbonation processes in soils. Opportunity will be given properly qualified students to take up minor research problems in any phase of these processes.

FOR GRADUATES

Prerequisite for Graduate Work: Students expecting to major in soils are urged to elect additional courses in general chemistry, qualitative and quantitative analysis, and organic chemistry. In addition to the above, courses in bacteriology, plant physiology, and physical chemistry are suggested.

801. Research in Soils. Five credit hours. Autumn, Winter, Spring Quarters. Mr. Bear, Mr. Conrey.

Opportunity will be given to students who have had satisfactory preliminary training, to carry on library, field, greenhouse, or laboratory research along physical, chemical, or biological lines as related to soils.

802. Soil Seminary. One credit hour. Autumn, Winter, Spring Quarters. Mr. Bear.

A weekly conference of graduate students and departmental members in which the research work of members of the seminary or related topics will be discussed.

SPANISH

(See Romance Languages and Literatures)

VETERINARY MEDICINE

Office, 103 Veterinary Laboratory

PROFESSORS WHITE AND GOSS, MR. REBRASSIER, MR. HENDERSHOTT

FOR GRADUATES

Prerequisite for Graduate Work: The required training in pathology and the permission of the instructor.

821. Pathological Technique. Two or five credit hours. One Quarter. Autumn, Winter, Spring. Mr. Goss, Mr. Rebrassier, Mr. Hendershott.

The general and special methods involved in autopsy and laboratory diagnosis are given special consideration.

822. Special Anatomical Pathology. Five credit hours. One Quarter. Autumn, Winter, Spring. Mr. Goss, Mr. Rebrassier, Mr. Hendershott.

The gross and microscopical changes of pathological lesions of special regions are carefully considered.

823. Special Bovine Pathology. Five credit hours. One Quarter. Autumn, Winter, Spring. Mr. Goss, Mr. Rebrassier, Mr. Hendershott.

The genital organs of the cow are studied with special regard to the causes and changes occurring during pregnancy and in sterility.

824. Special Pathology Problems. Five credit hours. One Quarter. Autumn, Winter, Spring. Mr. Goss, Mr. Rebrassier.

This course is intended to accommodate students who have special problems upon which they wish to do further work.

825. Special Poultry Pathology. Five credit hours. One Quarter. Autumn, Winter, Spring. Mr. Goss, Rebrassier.

This course permits the study of the diseases of fowls, with regard to the causes, lesions, and diagnostic methods.

VOCATIONAL EDUCATION

Office, 323 Campbell Hall

PROFESSOR MacDONALD

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: The permission of the instructor in charge.

602. Principles and Problems of Part-time Education. Three credit hours. Autumn Quarter. Mr. MacDonald.

An introductory course consisting of a study of types of part-time education and the aims and purposes of each, problems of organization, administration, and teaching.

603. Principles and Problems of Vocational Education. Three credit hours. Spring Quarter. Mr. MacDonald.

A consideration of the meaning, scope, aims, and need for the various types of vocational education with emphasis upon the trade and industrial type. Attention is given to vocational education developments from the time of the guilds, not only in this, but in other countries.

606. Principles and Problems of Vocational Guidance. Three credit hours. Autumn Quarter. Mr. MacDonald.

An inquiry as to the origin, development, meaning, scope, purposes, and methods of vocational and educational guidance.

ZOOLOGY AND ENTOMOLOGY

Office, 101 Botany and Zoology Building

PROFESSORS OSBURN, OSBORN (RESEARCH), BARROWS, KRECKER, AND DeLONG, ASSOCIATE PROFESSOR HINE, ASSISTANT PROFESSORS KENNEDY AND KOSTIR

ZOOLOGY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in zoology. Courses 605, 606, 607, 615, 616, and 617 require also two additional Quarters of biological science.

601-602-603. Advanced Studies in Animal Heredity. Three credit hours. Autumn, Winter, Spring Quarters. One lecture and two laboratory periods each week. Mr. Barrows.

A portion of this course will be devoted to the study of recent advances in the field of animal heredity, but a large part of the work will consist in the breeding of

animals in the laboratory and the analysis of data collected.

This course is not open to students who have credit for Zoology 129-130.

604. Animal Ecology. Five credit hours. Spring Quarter. Two lectures and three two-hour periods of laboratory or field work each week. Mr. Kreckler.

An introduction to the study of animals in their natural surroundings which will include ponds, streams, fields, and woodlands. Animal associations and the various factors which affect animals in relation to their environment are considered.

This course is recommended to students who expect to teach biology. Students who desire to continue the subject may take up some particular phase of the work and should register in Zoology 610-611-612-613.

This course is not open to students who have credit for Zoology 159.

605-606-607. Animal Behavior. Three or five credit hours for one or more Quarters. Autumn, Winter, Spring Quarters. One lecture and the remainder laboratory work. Recommended to students in psychology. Mr. Barrows.

Devoted to a study of the functions of the various parts of the nervous systems of the invertebrates and vertebrates, with emphasis on the mechanics of adjustment to heat, light, chemical, and mechanical stimulation. Considerable time will be spent on experiments with living worms and insects.

This course is not open to students who have credit for Zoology 153-154.

611-612-613. Minor Investigations. Three or five credit hours each Quarter. Autumn, Winter, Spring Quarters. A student may enter at the beginning of any Quarter. Mr. Osburn, Mr. Osborn, Mr. Hine, Mr. Barrows, Mr. Kreckler, Mr. DeLong, Mr. Kennedy, Mr. Kostir.

After conference with the professor in charge, the subject for investigation may be selected in life history, development, structure, classification, ecology, reactions, apiculture, or some other phase of zoological or entomological study.

615-616. Advanced Zoology of Invertebrates. Five credit hours. Autumn and Winter Quarters. Two lectures and three two-hour laboratory periods each week. Lectures, laboratory exercises and occasional field trips. Mr. Kostir.

A study of the structure, life histories, habits, and relationships of invertebrate animals, together with the consideration of important biological principles. Especially recommended as a second year course for students specializing in zoology.

This course is not open to students who have credit for Zoology 121-122 or 405-406.

617. Cellular Biology. Five credit hours. Spring Quarter. Three lectures and four laboratory hours each week. Mr. Kostir.

A study of the organization and activities of the living cell. Special attention will be given to the results of the investigation of unicellular organisms.

FOR GRADUATES

Prerequisite for Graduate Work: Students expecting to major in this department must be familiar with the elements of related sciences, and must have had at least two

years of work in zoological subjects. It is desirable also that the student should have a reading knowledge of French and German.

801-802-803. Seminary in Zoology. One credit hour. Autumn, Winter, Spring Quarters. Mr. Osburn.

Discussion of assigned subjects, reports on research work, current literature, etc. All graduate students in the department are expected to register in this course as long as they are in residence.

This course is not open to students who have credit for Zoology 201-202.

805-806-807. Invertebrate Zoology. Five credit hours. Autumn, Winter, Spring Quarters. Mr. Osburn.

A detailed study of invertebrate groups with special reference to morphologic features and discussions of their significance in adaptation, phylogeny, and taxonomy.

This course is not open to students who have credit for Zoology 247-248.

808-809. Invertebrate Embryology. Three or five credit hours. Autumn and Winter Quarters. Lectures, reading, and laboratory. Prerequisites, the equivalent of Entomology 651-652 and 656, or Zoology 805-806-807. Mr. Osburn.

811-812-813. Research Work. Subject to be chosen after consultation. Three to ten credit hours each Quarter. Offered every Quarter and may be repeated as often as is necessary in pursuit of special research. Mr. Osburn, Mr. Osborn, Mr. Hine, Mr. Barrows, Mr. Kreckler, Mr. DeLong, Mr. Kennedy, Mr. Kostir.

Problems in development, life history, morphology, ecology, genetics, animal behavior, parasitology, taxonomy, or other zoological or entomological subjects may be undertaken. For some of these the opportunities are particularly good at the Lake Laboratory. Students interested should send for the Lake Laboratory Bulletin.

ENTOMOLOGY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for All Courses in This Group: Fundamental courses in zoology and entomology in addition to any prerequisites stated in the description of the courses.

611-612-613. Minor Investigations. Three or five credit hours each Quarter. Autumn, Winter, Spring Quarters. A student may enter at the beginning of any Quarter. Mr. Osburn, Mr. Osborn, Mr. Hine, Mr. Barrows, Mr. Kreckler, Mr. DeLong, Mr. Kennedy, Mr. Kostir.

After conference with the professor in charge, the subject for investigation may be selected in life history, development, structure, classification, ecology, reactions, apiculture, or other phase of zoological or entomological study.

651-652. Advanced Entomology. Five credit hours. Autumn and Winter Quarters. Two lectures and three two-hour laboratory periods each week. Mr. Kennedy.

Advanced practical course dealing with morphology, development, biological relations and principles of classification, for those wishing to investigate some special group of insects or to fit themselves for professional work in entomology.

653-654. Insect Control. Five credit hours. Autumn and Spring Quarters. Two lectures and three laboratory periods each week. Mr. DeLong.

Principles of economic entomology, utilization of parasitic and predaceous forms, entomophagous fungi and bacteria, circumvention and exclusion, cultural methods, traps and trap crops, heat, animal dips, insecticides, insecticide machinery, and accessories, and practical work in fumigation, spraying, inspecting, preparing an entomological exhibit and a collection of economic insects, rearing and insectary methods. Practical course intended to anticipate, so far as possible, the requirements and difficulties which the student will encounter in state or federal entomological work.

This course is not open to students who have credit for Entomology 151-152.

655. Medical and Veterinary Entomology. Five credit hours. Winter Quarter. Three lectures and two laboratory periods each week. Given biennially. Mr. DeLong.

The insects, mites, and ticks which cause or transmit diseases of man and domestic animals; the sources of infection, methods of transmission and interrelation with pathogenic bacteria and protozoa; the relations of the subjects to parasitology, bacteriology, veterinary medicine, sanitary engineering and public health; field observations of unsanitary conditions, practice in feeding, breeding and handling experimental insects, and practical problems in the control of parasites and insect-borne diseases.

The student is advised if possible to take Zoology 404 before electing this course.

This course is not open to students who have credit for Entomology 149.

656. Morphology and Development of Insects. Five credit hours. Autumn Quarter. Two lectures and three two-hour laboratory periods each week. Mr. Kennedy.

An advanced comprehensive course on the internal structures of insects, together with what is known of their functions; morphology, histology, histogenesis, embryology, and metamorphosis.

This course parallels the work of Entomology 454-455 and 651-652, with emphasis on internal structures and functions.

This course is not open to students who have credit for Entomology 162.

FOR GRADUATES

801-802-803. Seminary in Entomology. One credit hour. Autumn, Winter, Spring Quarters. Mr. Osburn.

Discussion of assigned subjects, reports on research work, current literature, etc. All graduate students in the department are expected to register in this course as long as they are in residence.

This course is not open to students who have credit for Entomology 201-202.

811-812-813. Research Work. Subject to be chosen after consultation. Three to ten credit hours each Quarter. Offered every Quarter and may be repeated as often as is necessary in pursuit of special research. Mr. Osburn, Mr. Osborn, Mr. Hine, Mr. Barrows, Mr. Krecker, Mr. DeLong, Mr. Kennedy, Mr. Kostir.

Problems in development, life history, morphology, ecology, genetics, animal behavior, parasitology, taxonomy, or other zoological or entomological subjects may be undertaken. For some of these the opportunities are particularly good at the Lake Laboratory. Students interested should send for the Lake Laboratory Bulletin.